MODEL NO. 1412

DRIVER ALERT

EDUCATIONAL KIT MANUAL 2009

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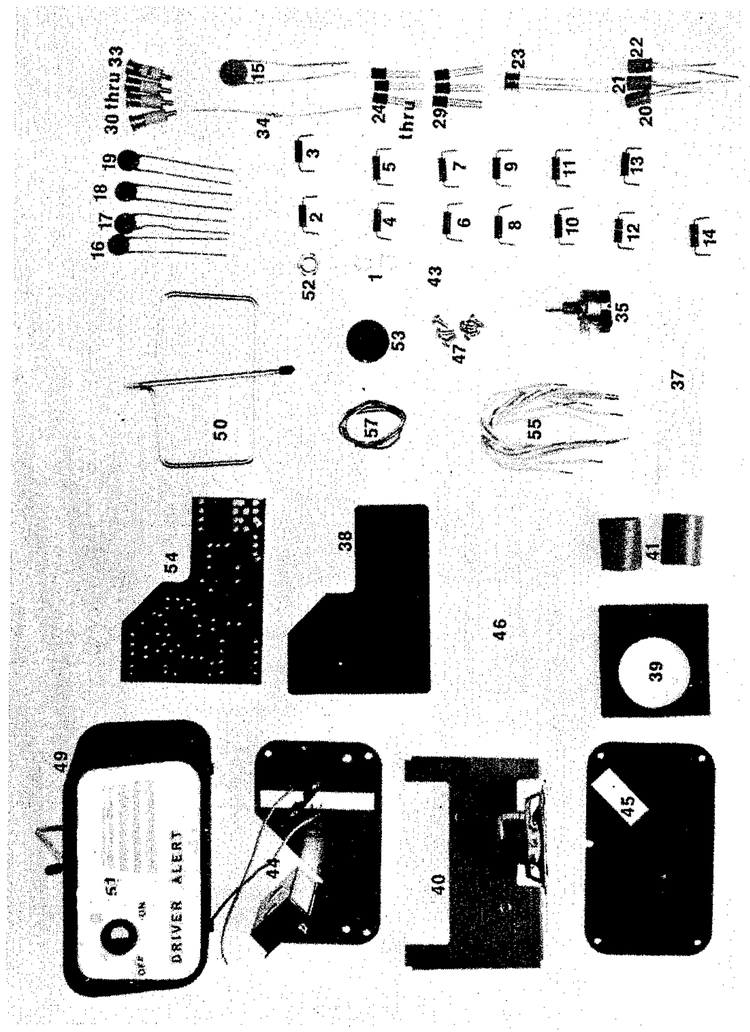
PARTS IDENTIFICATION



DRIVER ALERT

The Driver Alert® is a miniature, transistorized, electronic MICROWAVE detector. It is completely self-contained, having a special built-in antenna and battery power supply. Its dual bi-polarized antenna continuously and simultaneously monitors the "X" band (10,525 MHz) horizontally and vertically polarized speedmeters. When the Driver Alert intercepts a radar beam it produces an audible warning that alerts you to check immediately on your speed and surrounding traffic conditions.

Driver Alert is precisely constructed (when you have finished the kit) of high quality components, including 7 transistors. The placement of the internal wiring and circuit elements is very critical, and must not be changed from the directions given in the instructions for construction. Any attempt to alter the relationship of the components will change the sensitivity of the receiver. The batteries can be changed by removing two screws which hold a cover plate in the bottom of the unit.

The Driver Alert will also react to airport radar and military installations of radar. The zip-zip noise heard when near an airport or an airplane with radar tells how frequently the antenna is rotating. It is also possible to use the Driver Alert to detect microwave emissions from various locations. It is a handy device to use for checking leakage from the plumbing associated with microwave installations. Other uses for the Driver Alert include the detection of transmitted signals from microwave installations and the checking of the alignment of the receiving antenna with the transmitting antenna. Proper alignment of the transmitter antenna with the receiving antenna can reduce the required amounts of radiated rf energy from a microwave transmitter. The louder the sound from the speaker the stronger the signal being received. A relative indication of just how much leakage is taking place can be found by listening closely to various levels of output. This type of device has been used by telephone maintenance crews for microwave installations and for all types of microwave applications in military installations.

MOUNTING PARTS AND SOLDERING

In order to properly mount electronic parts some guidelines should be established. Figures A and B show how printed circuit parts are mounted to the board and soldered properly.

Figure C shows that parts must be attached mechanically before soldering. A pair of long nose pliers is usually sufficient to crimp leads to terminals before soldering.

SOLDERING. Apply enough heat to the metal surfaces so the solder spreads freely. Too much heat for too long a period (over twelve seconds) on a printed circuit board causes the copper foil to lift off the phenolic board. You are not using enough heat if the solder barely melts and makes a rounded ball of rough, flaky solder. The soldering iron should be 27 to 40 watts in size. Make sure a clean surface is available on the tip of the iron to melt the solder. Apply a small amount of solder to the tip to help transfer the heat. However, the metal parts being soldered should be hot enough to melt the solder when applied. Too much solder can cause shorts or bridging between points on the printed circuit board. If a soldering gun is used make sure the tip is up to full heat before applying solder. A clean tip can be had by wiping the hot iron with a cloth. Do not use acid core solder or clean the tip of the gun or iron on a sal ammoniac block.

Do not move parts until solder becomes hardened. Large metal surfaces require more heat or a longer time to reach the proper temperature to melt solder for a good joint.

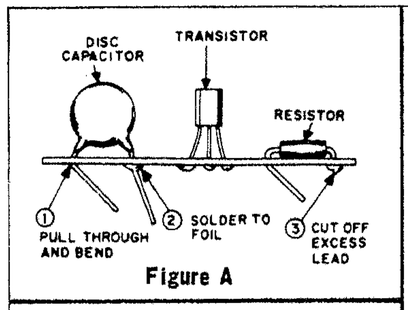


Figure A

Figure B

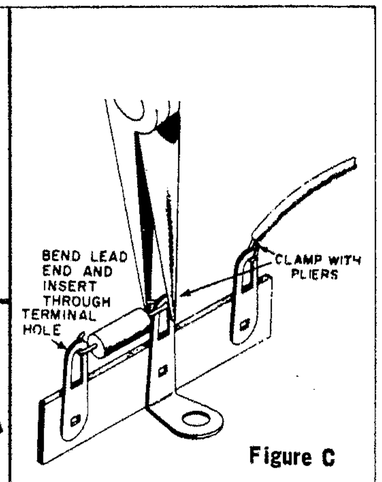


Figure C

WARNING	Ownership of a Driver Alert is not an invitation to speed . . . nor to deliberately violate speed limits which have been established for your protection. The Driver Alert's purpose is to help the conscientious driver (who at times may inadvertently exceed posted limits by a few mph) to maintain legal speeds . . . and to protect him against rural "traps" where radar controls are used to produce revenue rather than to promote safe driving.

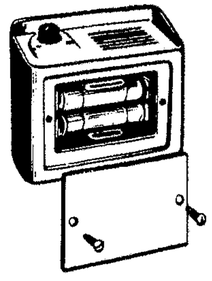
TESTING FOR PROPER OPERATION

The best test is in the area of a radar speed meter. However, you can often pick up a signal in the vicinity of an airport or military installation. Aeronautical radars "search" with rotating antennas and produce short, intermittent sounds on the Driver Alert. They are easily distinguished from the clean, clear-cut tone produced by the speed meter.

Some cities have radar controlled traffic lights. The radar unit operates in the "S" band at 2455 MHz. If you drive under one of these units (a large white pan-like object jutting over the traffic lane) a very loud noise will be emitted from the Driver Alert unit and you will know that the "S" band part of the unit is working. The antenna for the "S" band is the slot in the back of the receiver with two radar diodes mounted across it.

BATTERY REPLACEMENT

When the static background can no longer be heard on the Driver Alert it is time to change the batteries (mercury cells).



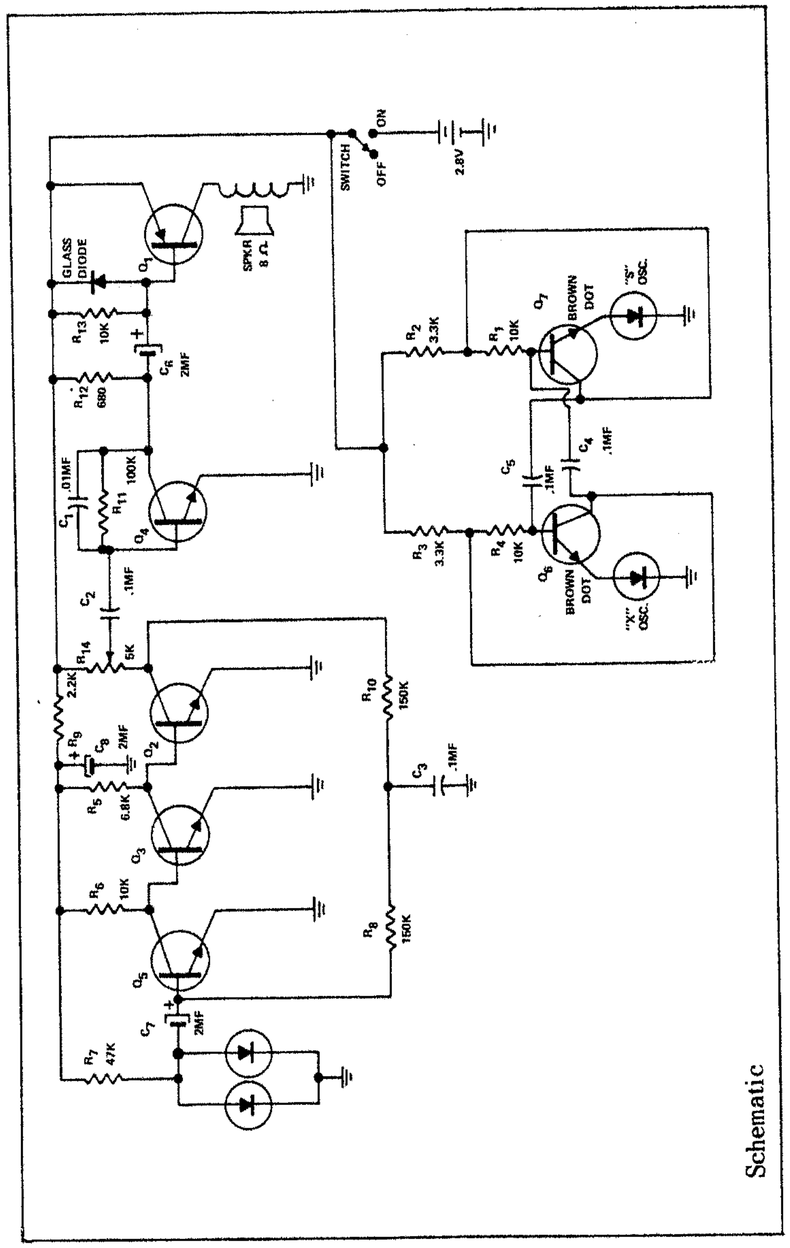
NOTE: EXPLODED VIEW ON PAGES 14 & 15 SHOWS ALL PARTS ACCORDING TO REFERENCE NO. LISTED HERE.

PARTS LIST

Ref. No.	Quantity	Description
1	2	Radar Diode Clip
2	1	Resistor, R_1, 10K ohms (Brown, Black, Orange)
3	1	Resistor, R_2, 3.3K ohms (Orange, Orange, Red)
4	1	Resistor, R_3, 3.3K ohms (Orange, Orange, Red)
5	1	Resistor, R_4, 10K ohms (Brown, Black, Orange)
6	1	Resistor, R_5, 6.8K ohms (Blue, Gray, Red)
7	1	Resistor, R_6, 10K ohms (Brown, Black, Orange)
8	1	Resistor, R_7, 47K ohms (Yellow, Purple, Orange)
9	1	Resistor, R_8, 150K ohms (Brown, Green, Yellow)
10	1	Resistor, R_9, 2.2K ohms (Red, Red, Red)
11	1	Resistor, R_{10}, 150K ohms (Brown, Green, Yellow)
12	1	Resistor, R_{11}, 100K ohms (Brown, Black, Yellow)
13	1	Resistor, R_{12}, 680 ohms (Blue, Gray, Brown)
14	1	Resistor, R_{13}, 10K ohms (Brown, Black, Orange) (All resistors ½ watt.)
15	1	Capacitor, C_1, .01 MF
16	1	Capacitor, C_2, .1 MF
17	1	Capacitor, C_3, .1 MF
18	1	Capacitor, C_4, .1 MF
19	1	Capacitor, C_5, .1 MF

Ref. No.	Quantity	Description
20	1	Capacitor, C_6, Electrolytic Capacitor, 2.2 MF or 2.0 MF
21	1	Capacitor, C_7, Electrolytic Capacitor, 2.2 MF or 2.0 MF
22	1	Capacitor, C_8, Electrolytic Capacitor, 2.2 MF or 2.0 MF
23	1	Transistor, Q_1, Black Cap
24	1	Transistor, Silicon, Q_2
25	1	Transistor, Silicon, Q_3
26	1	Transistor, Silicon, Q_4
27	1	Transistor, Silicon, Q_5
28	1	Transistor, Silicon, Q_6
29	1	Transistor, Silicon, Q_7
30	1	Diode, Radar, S-Band Detector (Purple)
31	1	Diode, Radar, S-Band, Oscillator (Black)
32	1	Diode, Radar, X-Band, Detector (Green)
33	1	Diode, Radar, X-Band, Oscillator (Brown)
34	1	Diode, Glass
35	1	Potentiometer, R_{14}, at 5K ohms with on-off Switch
36	1	Rubber band
37	1	Electrician's Tape
38	1	Insulation Board, phenolic
39	1	Speaker Gasket, Plastic
40	1	Speaker and power supply sub-assembly
41	2	Insulation Sleeve, Plastic
42	2	Batteries
43	2	Diode Insulation Sleeve
44	1	Antenna and diode sub-assembly
45	1	Back Cover, Plastic
46	1	X-Band Antenna
47	6	Screws, #4-40, Self-tapping (only 4 needed if case comes with Battery Cover Plate attached)
48	1	Battery Cover Plate (Bottom plate)
49	1	Case
50	1	Visor Clip
51	1	Frontice Piece
52	1	Nut, for potentiometer-on-off switch
53	1	Knob, for potentiometer-on-off switch

Ref. No.	Quantity	Description
54	1	Printed circuit board
55	9	Hook-up wire, 4" long, insulated (only 7 needed if S band diodes mount comes with wires attached)
56	1	¼" Insulation, spaghetti, for Transistor
57	1	Solder, Rosin Core, 60-40, 24"



Schematic

Place a check mark in each box as finished.

STEP BY STEP ASSEMBLY INSTRUCTIONS

1. Check all parts against the Parts List. Use Exploded View for identification of parts. See page 2 also.

2. Insert radar diodes into proper location. Check large diameter end for color marking. Check Exploded View for proper location of each.

   Diode Color Code:
   S-Band Detector is purple – Number 30
   S-Band Oscillator is black – Number 31
   X-Band Detector is green – Number 32
   X-Band Oscillator is brown – Number 33

3. Solder 4" length of insulated wire to one of the radar diode clips (for X-Band).

4. Snap the Clip around the top of either radar diode sticking above the "box-like" cavity on the Antenna and Diode Sub-Assembly. (Diode should be properly seated. Clip will fit over top rim and be flush with top of diode.)

5. Solder a 4" length of wire to the other radar diode clip.

6. Snap the clip around the top of the remaining X-Band radar diode. (As in Step #4, make sure top of diode clip is flush with top of the diode.)

7. There should be 2 wires already soldered to the back of the S-Band diode holders (Fig. 5 points A & B). If not please attach the 4" wires by soldering to these points. Check the diodes at this time to make sure they are secure in their individual holders and will not drop out if the sub-assembly is turned upside down. (Fig. 5 is on page 17.)

8. Set this assembly aside till later. Make sure the diodes have not dropped out or are loose in their holders.

9. Place resistors in their proper places on the printed circuit board. Resistors should fit flat against the board. Bend leads on copper clad side of the board to hold the resistors till soldered. (See Figs. 1 & 2 page 12.) Also check Figs. A & B page 4. Do not solder till step 10.

9a. R_1 goes in holes 1 & 2. (Brown, Black, Orange) 10K ohms.

9b. R_2 goes in holes 3 & 4. (Orange, Orange, Red) 3300 ohms.

9c. R_3 goes in holes 5 & 6. (Orange, Orange, Red) 3300 ohms.

9d. R_4 goes in holes 7 & 8. (Brown, Black, Orange) 10K ohms.

9e. R_5 goes in holes 9 & 10. (Blue, Gray, Red) 6800 ohms.

9f. R_6 goes in holes 11 & 12. (Brown, Black, Orange) 10K ohms.

9g. R_7 goes in holes 13 & 14. (Yellow, Purple, Orange) 47K ohms.

9h. R_8 goes in holes 15 & 16. (Brown, Green, Yellow) 150K ohms.

9i. R_9 goes in holes 17 & 18. (Red, Red, Red) 2200 ohms.

9j. R_{10} goes in holes 19 & 20. (Brown, Green, Yellow) 150K ohms.

9k. R_{11} goes in holes 21 & 22. (Brown, Black, Yellow) 100K ohms.

9l. R_{12} goes in holes 23 & 24. (Blue, Gray, Brown) 680 ohms.

9m. R_{13} goes in holes 25 & 26. (Brown, Black, Orange) 10K ohms.

DO NOT SOLDER AT THIS TIME

10. Solder the resistors in place and clip excess leads on the copper clad side of the board. Use a 37½ watt or 40 watt soldering iron. Do not heat any connection for over 12 seconds. Solder mask (green coating on the p.c. board) prevents excess solder and iciles of solder forming. Check Figs. A & B page 4.

11. Place Capacitor C_1 (.01 MFD) in holes 27 & 28. Bend leads to hold in place till soldered. Do not solder.

12. Place Capacitor C_2 (.1 MFD) in holes 29 & 30. Bend leads to hold in place. Do not solder.

NOTE: *(Make sure there are no solder bridges between copper paths on the printed circuit board. Be sure leads from the resistors do not touch to cause a short (see Fig. B, page 4).*

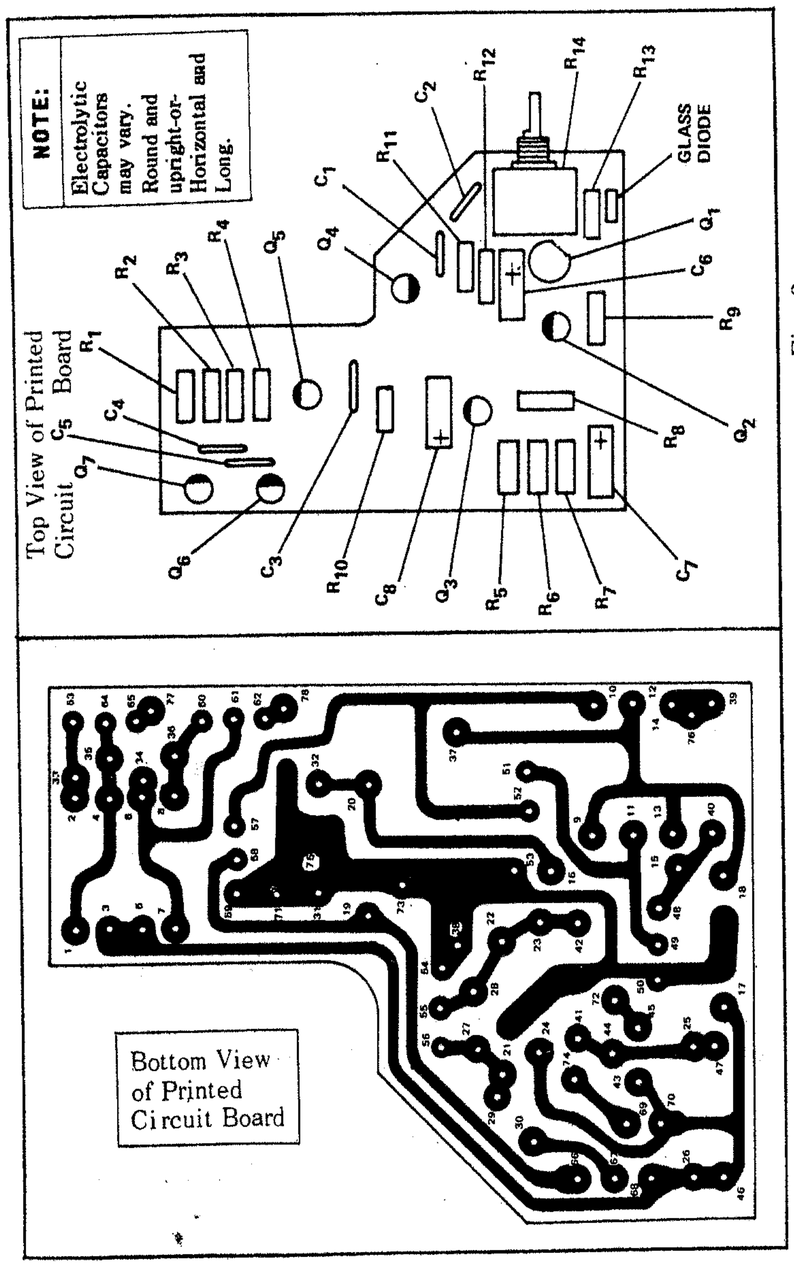


Fig. 2

Fig 1

13. Place Capacitor C_3 (.1 MFD) in holes 31 & 32. Bend leads to hold in place. Do not solder.

14. Place Capacitor C_4 (.1 MFD) in holes 33 & 34. Bend leads to hold in place. Do not solder.

15. Place Capacitor C_5 (.1 MFD) in holes 35 & 36. Bend lead to hold in place. Do not solder.

16. Solder the capacitors in place and clip excess leads. Check to make sure there are no bridges — or — shorted leads.

17. Place Capacitor C_6 (electrolytic — watch for + sign) in holes 41 & 42. All these electrolytics are the same size so use any one of them for C_6, C_7, or C_8. Make sure the + sign on the capacitor is inserted so that the + lead is in hole number 41. Bend the leads so the capacitor sits flat against the board. Do not solder.

NOTE: *Electrolytics may be tubular as shown in Fig. 2 or they may be cylindrical in shape for an upright mount as shown on the printed circuit board drawing in the Exploded View.*

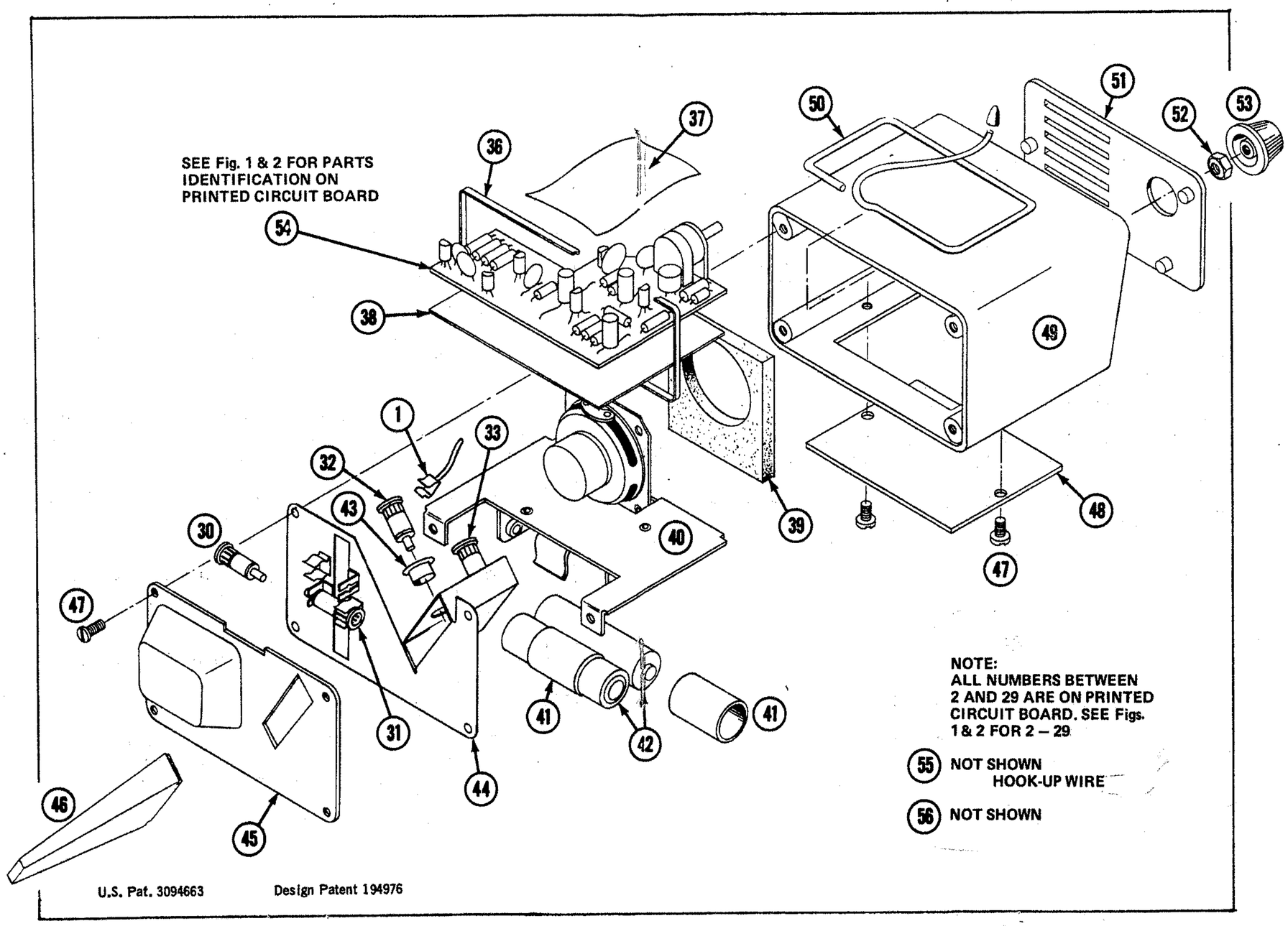
18. Place Capacitor C_7 in holes 39 & 40. Make sure the + lead is in hole 40. Bend leads so capacitor sits flat against the board. Do not solder.

19. Place Capacitor C_8 in holes 37 & 38. Make sure the + lead is in hole 37. Bend leads so capacitor sits flat against the board. Do not solder.

20. Solder electrolytics in place and clip the leads. Check for soldering bridges and shorts.

21. Place the Transistor Q_1 (silicon type with rounded top) in holes 43, 44 & 45. *Emitter* in hole 43. *Base* in hole 44. *Collector* in hole 45. Make sure ¼" of insulation is on the base lead. Transistor should stand ¼" above the surface of the printed circuit board. Bend leads on copper clad side to hold transistor in place till soldered. Note Fig. 3, page 16 for identifying the transistor leads.

22. Solder transistor Q_1 and clip leads. Do not overheat.


SEE Fig. 1 & 2 FOR PARTS IDENTIFICATION ON PRINTED CIRCUIT BOARD
NOTE:
ALL NUMBERS BETWEEN 2 AND 29 ARE ON PRINTED CIRCUIT BOARD. SEE Figs. 1 & 2 FOR 2 – 29
55 NOT SHOWN HOOK-UP WIRE
56 NOT SHOWN
U.S. Pat. 3094663
Design Patent 194976

23. Place transistor Q_2 in holes 48, 49, & 50. Base goes in hole 48, collector in hole 49, and emitter in hole 50. See Fig. 4, page 17, for identification of elements in silicon transistors. Hold transistor in right hand with thumb nail in slot and index finger on top of transistor. Leads should point toward you. Read left to right alphabetically. Base on left, collector in middle, and emitter on right. Top of transistor should not be any higher than the capacitors. Bend leads to hold the transistor in place. Do not solder.

24. Place transistor Q_3 in holes 51, 52 and 53. Base in hole 51, collector in hole 52 and emitter in hole 53. Do not solder.

25. Place transistor Q_4 in holes 54, 55 and 56. Base in hole 56, collector in hole 55 and emitter in hole 54. Do not solder.

26. Place transistor Q_5 in holes 57, 58 and 59. Base in hole 57, collector in hole 58 and emitter in Hole 59. Do not solder.

27. Place transistor Q_6 in holes 60, 61 and 62. Base in hole 60, collector in hole 61 and emitter in hole 62. Do not solder.

28. Place transistor Q_7 in holes 63, 64 and 65. Base in hole 63, collector in hole 64 and emitter in hole 65. Do not solder.

29. Place glass diode in holes 46 and 47. Cathode end (end with a dot or colored bands closest to the end) goes in hole 46. Bend leads to hold in place. Do not solder.

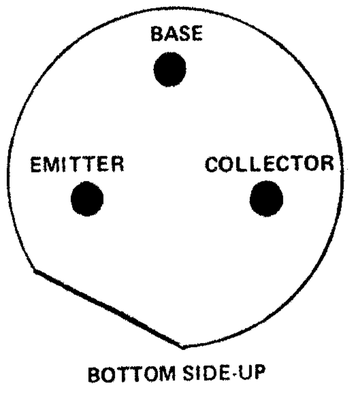


Fig. 3
Transistor

30. Solder the transistors and diode in place. Cut leads and check for solder bridges between copper lines and shorts between leads.

31. Insert potentiometer-on-off switch combination (R_{14}) into holes 66, 67, and 68 for potentiometer connections and holes 69 and 70 for on-off switch. Potentiometer switch should sit snugly against printed circuit board. Solder each of the 5 points.

32. Place a piece of 4" insulated wire into hole 71. Solder.

33. Place a piece of 4" insulated wire into hole 72. Solder.

34. Twist these 2 wires together for a couple of turns. They will go to the speaker during assembly.

35. Place a piece of 4" insulated wire in hole 73. Solder. Label this lead with a piece of paper around it: S-BAND SHORTING BAR.

36. Place a piece of 4" insulated wire in hole 74. Solder. This goes to the + side of the battery clip. Mark temporarily with a piece of paper with a + on it.

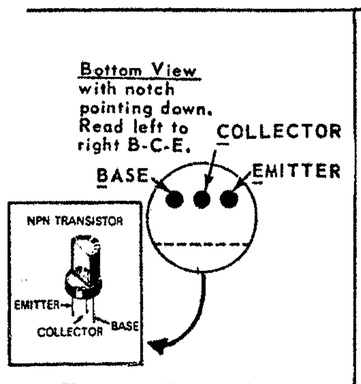


Fig. 4 Bottom View
Silicon Transistor

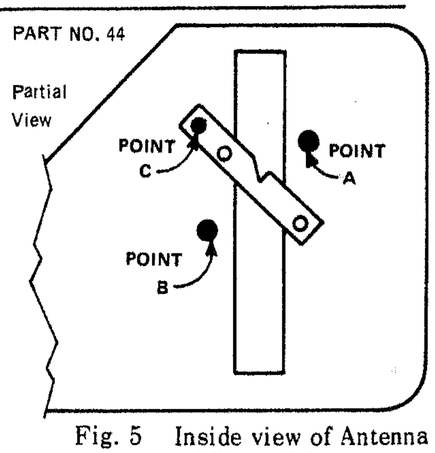


Fig. 5 Inside view of Antenna and Diode Sub-Assembly

37. Place a piece of 4" insulated wire at point 75. There is no hole here. Scrape some of the green coating off the copper at this point, Fig. 1. Solder the lead to the copper. This is the – lead to the battery clip. Mark temporarily with a piece of paper with a – on it.

38. Place the first sub-assembly on the work bench close enough to the printed circuit board to have the 4" leads from this antenna and diode sub-assembly reach the printed circuit board. Examine the Exploded View again for proper relationships.

39. Take the lead from the radar diode clip (Green Top Diode) #32 on the Exploded View and insert the other end of the lead into hole 76 on the printed circuit board. Solder. (You may have to re-heat the point if solder from previous soldering at this location has filled the hole.)

40. Check Fig. 5, page 17 and become familiar with the location of the points A, B, and C. Note the proper side of the unit is determined by the shorting bar across the slot.

41. Take a 4" lead from Point A in Fig. 5, page 17, and solder to clip lead on radar diode #32. This means the diode clip will now have two leads soldered to it at this point.

42. Take the 4" insulated wire with clip attached to radar diode #33 (Brown Top diode) to hole 77 on the printed circuit board. Solder lead to the printed circuit board.

43. Take the 4" insulated wire from Point B on Fig. 5, page 17, to hole 78 on the printed circuit board. Solder.

44. Take the lead from hole 73 of the printed circuit board and solder to Point C of Fig. 5, page 17.

45. Place the phenolic insulation board under the printed circuit board. It is the same shape as the printed circuit board.

46. Put a rubber band around the printed circuit board and insulation board (See Exploded View) to hold it in place during assembly only. See 36 on Exploded View.

47. Bring speaker and power supply sub-assembly close enough for leads from the printed circuit board to reach speaker and the power supply connections.

48. Thread two 4" leads from the printed circuit board through the sub-assembly by pushing the – & + wires downward alongside the speaker. Do not puncture the speaker cone.

49. Place the – lead on the – terminal of the battery clip. Solder.

50. Place the + lead on the + terminal of the battery clip. Solder.

51. Take the two remaining 4" wires and attach to top of speaker after untwisting them. Either lead can go to either terminal on the speaker. Careful – do not overheat these terminals. Don't allow both ends of the wires to touch the speaker's metal frame. This shorts the speaker and no audio output will be heard.

52. Be sure the switch is in the "off" position. You are ready to install the batteries; 2 type "AA" batteries are required. Place insulated sleeving over the center of each battery. Observing correct battery polarity (+ and –), snap the batteries down into the battery holder.

53. Place a piece of electrician's tape over components as shown in Exploded View (those directly behind the volume control) to prevent the antenna and diode sub-assembly touching and shorting out the transistor. See 37 on Exploded View.

54. TESTING

Turn the on-off switch and volume control to its halfway position. You should hear a static noise. Place two fingers across the X-band diodes. One finger on the #32 diode and one on the #33 diode. Touch the large diameter end of the diodes with the fingers. This is the "normal" screeching sound emitted when radar is detected. (See the explanation of the "circuit operation" to understand how an audio frequency is produced by the saturation of the resonant cavities.) Check the S-band by touching the large diameter ends of the two diodes across the tuned slot antenna. Same results – a screeching noise – is produced.

55. Turn the on-off switch to the "off" position.

☐ 56. ASSEMBLY OF UNIT INTO ITS CASE:

☐ 56a. Slide the visor clip into place in top of the case. See picture of Driver Alert on the manual cover and also refer to the Exploded View for proper location.

☐ 56b. Locate frontice piece in its proper holes and secure in place by applying a hot soldering iron to the white plastic points inside the metal case. This should hold the frontice piece in place permanently. Q_3 should be slightly bent toward C_8 to make room for X-Band cavity.

☐ 56c. Slide the printed circuit board and speaker-power supply assembly into the case. (See Exploded View for line-up.) Make sure the rubber gasket is in place inside the case against the large round hole in the front. Narrow strip of the gasket goes to the left side against the two round columns which terminate into screw holes 39 . Make sure the metal speaker and power supply sub-assembly fit into the slots in the sides of the case. Volume control shaft should fit properly so it goes through the hole allocated for it in the front of the case.

☐ 56d. Tighten the NUT on the potentiometer shaft. This should serve to hold the printed circuit board and the speaker sub-assembly in place firmly.

☐ 56e. Slide the knob over the potentiometer shaft. Turn the unit on and listen for the normal static noise. Then place fingers across the radar diodes as in testing section in step 54 to check for operation of the unit before the last portion is attached.

☐ 56f. Turn the switch to off position.

☐ 56g. Align antenna and diode sub-assembly so wires do not become loosened and X-band diode cavity doesn't short to the germanium transistor and tops of the metal electrolytic capacitor cases. This should have been minimized by the placement of tape earlier.

☐ 56h. Be certain that the clip or lead on the diode, Part #32, does not touch the visor clip. This diode clip may have to be rotated slightly.

☐ 56i. Place back cover (plastic one) over the metal sub-assembly of diodes. Align holes so screws can be inserted and tightened.

☐ 56j. Turn on the on-off switch and advance the volume control to mid-point. If you do not get any noise from the speaker the screws in the back have been tightened too much. Loosen a couple of them and listen again for the static noise. If no sound – take the back off and check the alignment of the metal sub-assembly which holds the radar diodes.

☐ 56k. Attach the X-Band antenna by placing it into the slot in the back of the unit designed to hold it.

☐ 56l. Unit is now ready to place on the sunvisor of your car.

☐ 56m. Test by driving under a radar controlled traffic light or near an airport radar station. Other microwave generators can also be used for checking.

OPERATION OF THE CIRCUITRY

The Driver Alert is a dual band receiver for reception on the "X" and "S" bands. X-band covers 8,200 MHz to 12,400 MHz and the "S" band covers 1,700 MHz to 2,600 MHz. It is a self-contained unit with its own battery power supply.

A resonant-slot antenna on the back panel of the case is tuned to the "S" band (or in particular 2455 MHz) which speed meters use. Whenever a microwave signal in the frequency range is received at the antenna it is passed through a diode. Instantaneous forward conduction of the diode inhibits the resonant condition in the resonator. Therefore, when the diode is not conducting it allows the resonant cavity antenna to build up to resonant conditions. (Check the schematic drawing to realize the full significance of the operation of the circuit.)

Once the microwave signal is detected by the detector diodes it is chopped into bursts of relatively short duration. These bursts, when detected, become an audio signal which is amplified by transistors Q_1 and Q_4. These transistors form an extremely high gain amplifier which amplifies up to 1000 times. R_{14} is the volume control and controls the amount of signal fed to the audio amplifier stages.

The X-band uses a tuned cavity type antenna which receives the signal through a dielectric or microwave lens (the plastic rod which protrudes from the unit in the back). The antenna is mounted at a 45° angle so it is effective on both horizontally and vertically polarized signals.

$DV = \frac{7.3 \text{ cyc/sec}}{\text{mile/hr}}$

Once the signal is received at 10,525 MHz it is fed to the radar diodes for the X-band and causes instantaneous forward conduction of the diode. This means the resonant conditions of the tuned cavity are shorted by the diode and the cavity ceases to function. Therefore, the diode has no signal to conduct and returns to a no-conduction state. As this happens the resonant conditions of the tuned cavity return and if a signal is present the diode conducts once again shorting the resonant cavity, repeating the previous operation. By conducting and not conducting the diode causes short bursts to be fed to the flip-flop oscillator to cause it to oscillate at about 700 Hz or in the audio range. This is amplified by the audio amplifier transistor to drive a speaker.

DRIVING SAFELY REQUIRES KNOWLEDGE OF CAR'S STOPPING ABILITY		
Speed (mph)	Distance before your foot touches brake	Distance travelled before car comes to complete stop
30	33 ft.	78 ft.
40	44 ft.	125 ft.
50	55 ft.	188 ft.
60	66 ft.	272 ft.
70	77 ft.	381 ft.

INSTALLATION OF THE DRIVER ALERT

Mounting is on the underside of one of the automobile's sunvisors. This assures maximum range and sensitivity. A clip for mounting the Driver Alert in this manner is furnished with the kit. If necessary, adjust the clip for a horizontal position of the unit.

The unit should be mounted behind the windshield in a location which provides an unobstructed "view" for the antenna (which is the back-plate of the case). Make sure the windshield wiper arms and blades do not rest in front of the antenna. At microwave frequencies metal can act as a reflector and scatter the waves thereby reducing the sensitivity of the unit.

OPERATION OF THE DRIVER ALERT

Advance the OFF-ON-VOLUME control knob until you can hear a slight background noise. This will sound somewhat like radio static. Do not turn it up louder than necessary to hear. The volume control affects only the loudness of the signal produced, and does not change the range sensitivity of the unit. Increasing the volume also increases the battery drain and shortens the battery life, just as it does in a transistor radio.

When the Driver Alert intercepts a radar beam it will automatically produce a warning sound similar to that which accompanies a TV test pattern. This gets loud very rapidly as you approach the source of the radar beam. It will stop as you pass out of the range of the transmitter.

Traffic conditions, terrain, and the method in which the radar speed meter is pointed determine the range of the Driver Alert. Normally, it will give advance warning of radar speed controlled zones. The Driver Alert does not interfere with car radio reception or with the radar speed meter since it is nothing more than a receiver.

FACTORY SERVICE

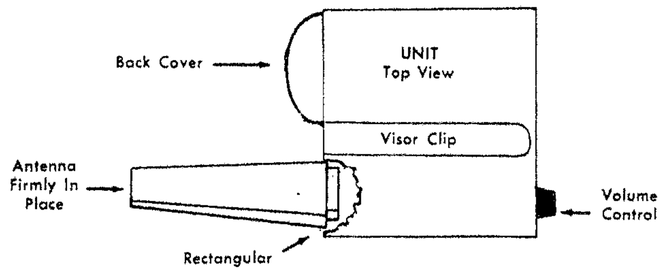
1. Do not return a project for servicing without writing to our Kit Repair & Service Dept., Radatron, Inc., Post Office Box 177, North Tonawanda, N.Y. 14120. Give the stock number of the kit and its name. Also include the date of purchase and what appears to be wrong with the project. We may be able to suggest a correction without having the project sent back to the factory.

2. Any of the projects may be returned to North Tonawanda for our inspection. Time limit for such service is 90 days after purchase. A service charge of $5.00 is needed to cover expense of handling and mailing.

3. Do not send projects which have not been wired. We are equipped to check for wiring errors and correct any defective components. Unwired kits will be returned with a note to explain the condition of the unit.

4. Anything wired with ACID CORE solder or soldering irons cleaned on sal ammoniac blocks are not eligible for our repair service and will be returned without repair.

DUAL BAND UNIT ANTENNA ASSEMBLY



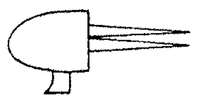
Insert large end of antenna in rectangular opening on back of unit so it fits squarely and is tight. If antenna becomes loose through taking in and out, put a little glue on end that fits in rectangular opening.

Be sure unit is as level as possible when clipped on sun visor, with antenna having a clear view of the road.

VERY IMPORTANT MICROWAVE TRANSMITTED INFORMATION

(How far you can expect your unit to pick up in advance.)

"X" (10,525 Mhz)



Power output approx. 100 mw
Distance speedmeter can clock:
short range: 150 ft.
medium range: 300 ft.
long range: 500-600 ft.
The unit picks up double the above distance and over.
Unit on side window or inside car.
(If they are out 300 ft., you will pick them up at 600 ft. or more, etc.)

Newest "X" (10,525 Mhz)

Power output approx. 50 mw
Distance speedmeter can clock:
short range: 150 ft.
medium range: 300 ft.
long range: 500-600 ft.
The unit picks up double the above distance, and over.
Unit on side window or inside car.
(Example: if they are out 500 ft., you will pick them up at 1000 ft. or more, etc.)

CAPACITORS

CAPACITOR IDENTIFICATION

The capacitors in your kit (named for their capacity for storing electrical energy) may be of several different types. You must choose the correct capacitor for each step, or the kit will not work as designed.

TYPE OR SHAPE. Select by type or shape such as disc, or electrolytic.

CAPACITY VALUE. Select by capacity value, given in microfarads (μf or mf) or micro-microfarads ($\mu\mu$f, mmf or pf). Most small values are stated in micro-microfarads such as 10$\mu\mu$f and 270$\mu\mu$f. Larger values are given in microfarads as .02μf and .015μf.

On some disc capacitors, values may be stated either in μf or $\mu\mu$f. To change from μf to $\mu\mu$f, simply move the decimal point to the right 6 places. Here are a few examples of alternate markings:

.0022 μf equals 2200 $\mu\mu$f
.01 μf equals 10,000 $\mu\mu$f
.0033 μf equals 3300 $\mu\mu$f

VOLTAGE RATINGS. The capacitor may be marked with the maximum operating voltage, such as 5 v, 15 v, 25 wvdc. Where these are important they will be stated.

TOLERANCE ratings are given in percentages (%). Where these are important they will be stated. Manufacturer's type number such as SK, BIT, SPRAGUE, CRL, Z5F, etc. are not used for identification purposes.

RESISTORS

0 . . . black	5 . . . green
1 . . . brown	6 . . . blue
2 . . . red	7 . . . violet
3 . . . orange	8 . . . gray
4 . . . yellow	9 . . . white

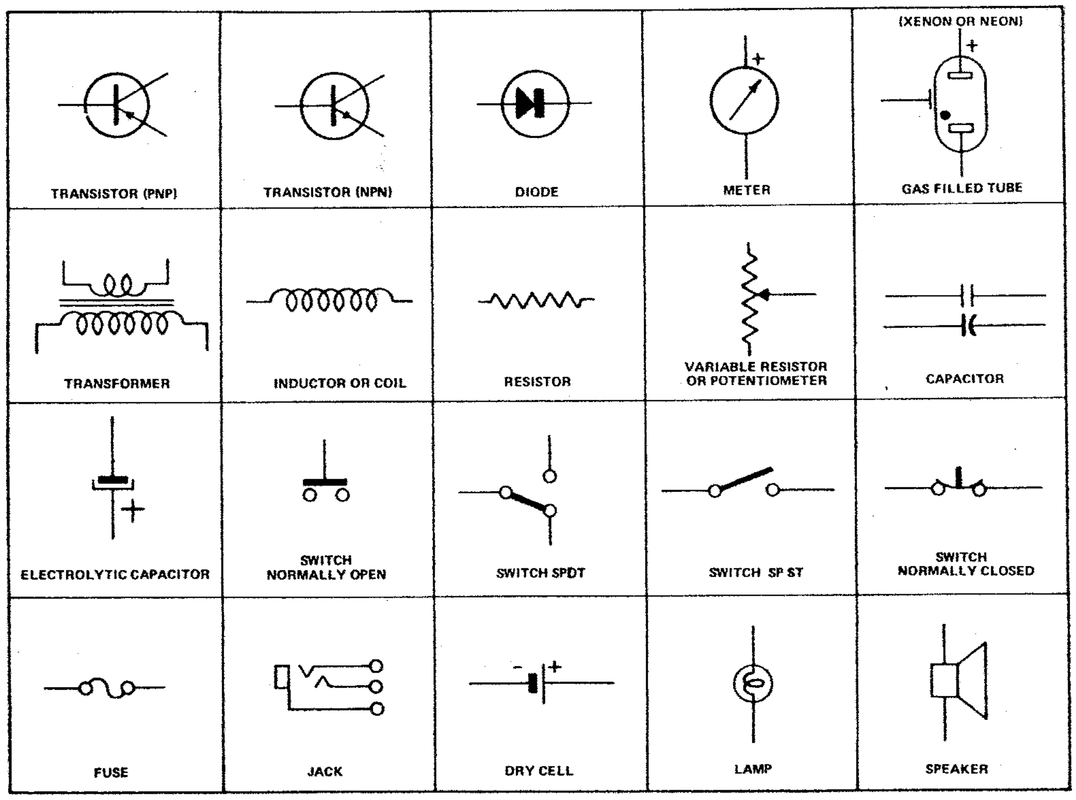
COLOR CODE

To read the value of a resistor, start at the end closest to the color bands. Write down the number for the first band, 6 (blue) in the example shown on this page. To the right of 6, write the number for the second band, 8 (gray) in our example. The third band gives the number of zeros. Since the third band in our example is yellow, write 4 zeros (0000) next to the 68, making the number 680,000 ohms. This is usually given in a short form, 680K, with K standing for a thousand ohms.

The fourth color band shows the tolerance rating, or how closely the resistance value is controlled in manufacture. Silver indicates a tolerance of ±10%, gold, ±5%. No band, ±20%.

SPECIAL CASE. For resistors under 10 ohms, the third color band will be silver or gold. If the third band is gold, the resistor is between 1 and 10 ohms so the decimal point goes between the first and second digit. For example, blue, gray, gold is 6.8 ohms. But if the third band is silver, the value is less than 1 ohm, with the decimal point before the first digit. For example, blue, gray, silver is .68 ohms.

SYMBOLS USED IN SCHEMATIC DRAWINGS



SYMBOLS CHART

GUARANTEE

Radatron guarantees that all the component parts of this kit are free of defects in material and workmanship. We Guarantee each part and the fact that each required component part for each kit is packaged in the unit. If any claims are made for missing parts please make them within 10 days of receipt of the kit. The right to request the return of defective parts in the case of faulty components is reserved.