Note: Some illustrations have been reduced in this sample to shrink the file size, but are often full pages in the actual books. The text may also refer to pages or figures that are not included in this sample. These graphics were scanned using greatly compressed JPG files and do not represent the real picture quality in the books.

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Power mikes suffer from the same connector and cord problems as regular mikes. But here we have some extra possibilities:

1. Weak or dead battery, or broken wire inside the snap connector of mikes that use standard 9-volt transistor batteries. When the voltage measured with your VOM drops about 0.5-1.0 volt from its rated voltage, it's time to replace it. By the way, if you're having trouble finding those strange little 7-volt batteries, like the Radio Shack 23-601 or Eveready E-175, you can often get them in photographic equipment shops
2. Sometimes the little metal spring clip that holds the battery is too loose to make a good contact. These are used on some Turner and GC mikes. Use a fine screwdriver or needle-nose pliers to bend the ends slightly tighter towards each other.
3. Battery reversed. The solution is obvious. The [+] and [–] ends are always marked on both the battery and clip holder.

PROBLEM — SQUEALS ON TX

A very common problem! If the mike is correctly wired and there are no broken wires in the plug or cord, the squeal is being caused by RF feedback. Fancy name, easy solution. Often the stock mike works fine, and the squeal only starts when you try to wire up a power mike. There's nothing wrong with the power mike. RF feedback means that some of your TX energy is getting back into the audio or modulation circuit of the CB. It starts a continuous cycle of oscillation or feedback, just like a PA system with the mike too close to the speaker. The most common causes are poor RF filtering in the CB, or high antenna SWR. The cure is cheap and simple.

How To Cure The Squeal

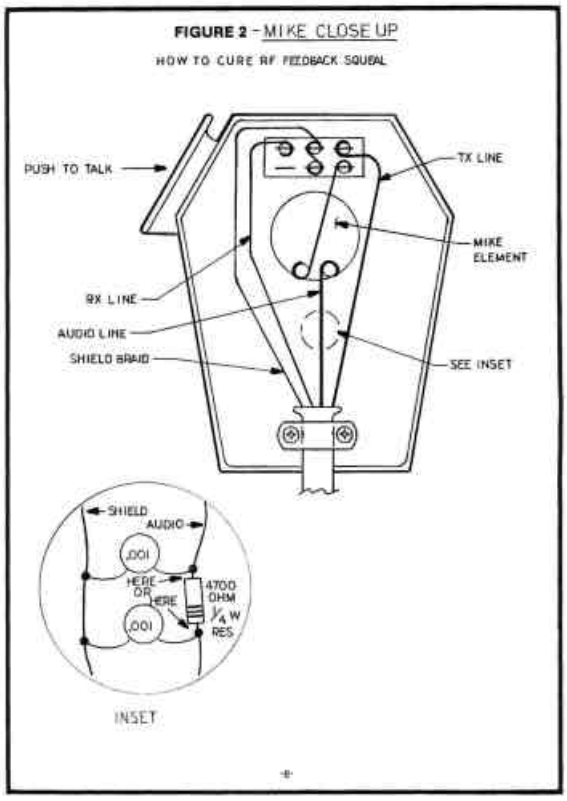
1. Open the mike and figure out which colored wire is the actual audio or mike line. (See Figure 2 and Mike Wiring section to determine this.)
2. After finding the audio line, cut it at a convenient spot and insert a 4700Ω (4.7KΩ, YELLOW-VIOLET-RED), ½-watt or 1/4-watt resistor in series with the audio line. See the inset in Figure 2.
3. For extra filtering protection, also connect a .001µF or .01µF ceramic disc capacitor from either side of your resistor/audio line connections to the bare twisted shield braid of the mike cable.

The value of these parts isn't critical; just get the physically smallest ones you can find, like a 1-watt resistor and a 50-volt capacitor. These will easily fit inside the mike. Solder and tape all your connections. (Please, no Scotch Tape!) These parts together cost about 50¢, and will prevent RF energy in the TX circuits from getting into the mike. This works 99% of the time.

OTHER MIKE PROBLEMS

In some rare cases, the mike element itself is defective. This is the little round piece with the two wires coming from it, and a very thin diaphragm facing towards the outside of the mike. The only way to confirm this is with an Ohmmeter, as follows:

1. Unplug the mike from radio. If the mike doesn't use a connector, or is a power mike, you'll have to unsolder either of the two wires on the mike element to make an accurate test.
2. Use your Ohmmeter on anything but the Rx1 scale, like Rx100 or Rx1KΩ. Touch the test probes to the two mike element solder points. The meter should deflect and show a definite resistance on some scale. If you see no deflection on any scale the mike element is defective, burned open internally. Unfortunately, these elements come in so many shapes and sizes you'll probably never find an exact replacement, so you'll have to replace the entire mike.



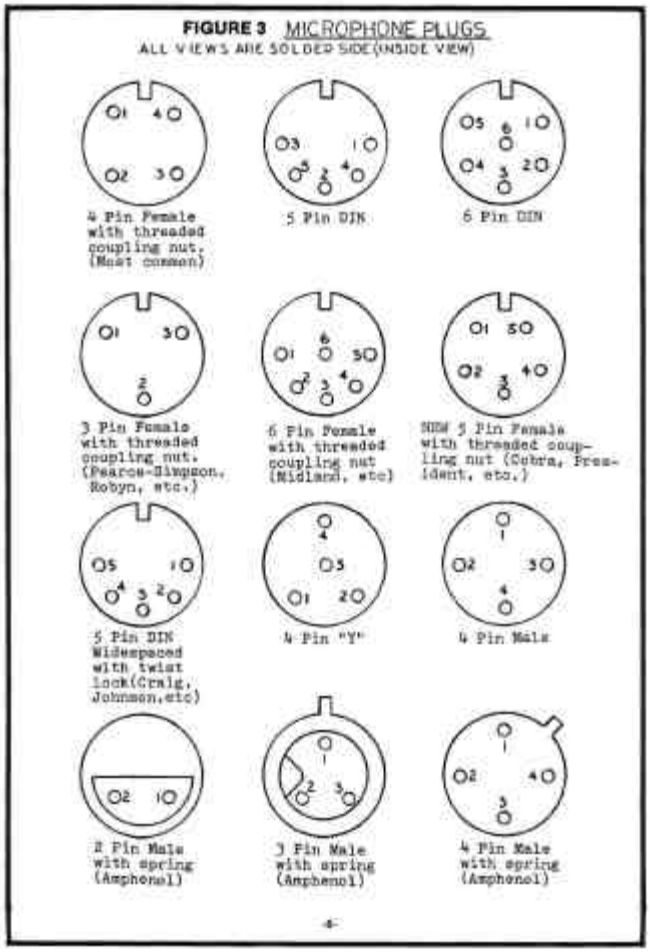
Note:
If you just got a bargain used mike from somebody, don't plug it in before testing! Make sure it came from the same brand as yours, or you may cook your radio for an expensive repair Even though the connector is the same, it's rarely wired the same. Mike wiring varies tremendously between brands and even between different models of the same brand. For example, a 4-pin Cobra mike won't work on a 4-pin Royce radio. Always check the wiring first, as described next.

HOW TO WIRE ANY REGULAR OR POWER MIKE TO (ALMOST) ANY CB

There are three steps when wiring any new mike to your CB:

1. Determine which pin on the radio's mike socket performs which function (TX, RX, Audio, Ground) on the CB itself.
2. Determine which color wire on the new mike performs the same function.
3. Be able to neatly solder and insulate those wires on the corresponding pins of the new plug.

Figure 3 shows pin numbering for most common mike sockets, and Figure 4 lists the color codes of many popular brands.



Before you even start, you must know if the CB uses relay or electronic switching between TX and RX. This is easy to figure out. While listening to a signal, unplug the mike. If you can still hear something, it's relay switched. If the speaker goes dead but the S/RF meter still shows a signal there, you have electronic or diode switching. If your CB only has a 3-pin mike socket (Pearce-Simpson, some Robyns, etc.) this is a dead giveaway that the CB is relay switched; electronic switching requires at least four wires.


FIGURE 4
MIKE COLOR CODES

TURNER

"J" indicates Electronic Switching, as in JM+2U, JM+3U, RK4DJ, RK7DJ, and +2 Base in "E" position

shield	common
white	mike or audio
black	TX
red	RX

Note: Turner is eliminating the 3 wire/shield cable and will eventually sell its mikes with 5 wire/shield. This is to accomodate sets requiring more wires than the old cable provides. Otherwise, the mike is EXACTLY the same except for model number. For example, the 3-wire JM+3 becomes the 5-wire+5B. You can convert as follows:

OLD TURNER 3 wire/shield

shield	common
white	mike or audio
black	TX
red	RX

NEW TURNER 3 wire/shield

red & shield	common
white	mike or audio
blue	TX
black	RX
yellow	not used

MURA and RMS Electronics

Models DX-11A, DX-11SC, DX-11SD, DX-11S, DX-12S.
Models CBM 5004, 5006

red & shield	common
yellow	mike or audio
blue	TX
green	RX

Model DX-11S Model CBM-5005

red & shield	common
yellow	mike or audio
violet	TX
white	RX

ASTATIC

D104-M, T-UG8-D104

shield	common
white	mike or audio
red	TX
black	RX

D104 with TUG8 or TUP4 stand, 1104C

blue & shield	common
white	mike or audio
red	TX
black	RX
yellow	not used

GC Electronics

Models 18-000, 18-010, 18-030, 18-050, 18-054

black & shield	common
red	mike or audio
yellow	TX
blue	RX
white	not used

RADIO SHACK (REALISTIC)

Regular and power mikes

shield	common
white	mike or audio
red	TX
black	RX
blue	not used

CAL COMM

Model 0857

black & shield	common
red	mike or audio
white	TX
blue	RX

ULTRATEC

E70-123

shield	common
red	mike or audio
white	TX
black	RX

270-245, 2400

shield	common
yellow	mike or audio
red	TX
violet	RX

E70-245, 246, 247 (4 wires/shield)

red & shield	common
yellow	mike or audio
blue	TX
green	RX

TRU BEAM MFG. 4DM 101A Power mike

red & shield	common
yellow	mike or audio
blue	TX
green	RX

K40 (AMERICAN ANTENNA CORP.)

black & shield	common
white	mike or audio
red	TX
blue	RX
yellow	not used*

*Audio return. Used in rare cases where mike audio must be grounded on RX. (Connect to black & shield in this case.)

Since diodes are cheaper than relays, most CBs use them. Some old 23-channel AM, all old 23 channel SSB, and the first generation 40 channel SSB (Cobra 138/139XLR, etc.) used relays. Nowadays all rigs use electronic T/R switching to save production costs.

Relay switching is generally easier to wire up, because you only need three connections: mike audio, ground, and the TX keyline that energizes the relay when grounded.

Electronic switching uses four wires: a common ground, mike audio, TX keyline that switches to TX when grounded, and RX speaker line that opens the speaker on TX to prevent feedback squeal.

OK, you know it requires either three or four wires in almost every case. These three or four connections are *regardless* of the number of pins on the CB socket. For example, if your CB has one of those female 5-pin or 6-pin DIN type sockets, only three or four of the pins are actually used. Manufacturers use the cheapest parts they can find. If they got a good deal on a million DIN sockets they'll build the radios with them, instead of using the superior 4-pin male socket with threaded coupling nut.

This wiring discussion assumes you have no schematic for the radio, or no information for the mike. First, figure out which pin on the mike socket does what. You'll need a real antenna or a Dummy Load, a clip-lead or piece of bare wire, and possibly an Ohmmeter.

Method #1: With The Use Of An Ohmmeter

1. The radio is *off* for this first test! Use the Rx1 resistance range. Attach one test lead to the BLACK power wire coming from the CB or slide mount, or the [–] pin on the DC socket of a base station radio. On a base station where the DC power socket isn't stamped with [+] and [–] symbols, you'll have to remove the cover. The inside of the DC socket will often use the standard RED [+] and BLACK [–] wiring method to guide you.

2. Leave one Ohmmeter lead on the BLACK or [–] wire or pin. Touch the other Ohmmeter test probe to all the mike socket pins, until you find one or two pins that make the meter deflect all the way over to 0Ω. That means a DC short (i.e., continuity) between the BLACK power lead and the socket pin you're testing. On a DIN type socket, the holes are too small to get the test probe in, so jam a bare into the socket holes as you proceed.

Once you know which pin this is, you've found the ground or "common" connection. Immediately draw a sketch of the socket, using its notch as a reference point. Mark the common ground lead you just found. Refer back to Figure 3.

Note:
When probing with a VOM on the mike pins of an electronically switched radio, you may hit one pin that makes a small crackling noise in the CB speaker. And it shows a few ohms of resistance. This is an obvious indication for the RX line. Mark it on your sketch. You can confirm this in Step #4 below.

3) Remove your Ohmmeter and turn on the CB. Now attach a clip-lead or a piece of bare wire to the common pin you found in Step #2. Start touching the other end of the wire or clip-lead to the remaining pins *briefly* and watch what happens.
4) In an electronically switched radio, you'll see the following: touching one pin will operate the receiver. Write it down. Another pin will key the transmitter, which you'll know by:

   - the TX light glowing
   - the Dummy Load/Mod. Light glowing brightly
   - hearing a dead carrier on another same-channel CB

   This is the TX line. Write it down.

If you hear a squeal or buzzing sound, release the wires; you've either found the audio (mike) line, or shorted the mike line to the speaker (RX) line. Assuming you found the common, the RX, and the TX in the steps above, the only thing left on the typical 4-pin socket must be the audio or mike line, so you're done!

On a 5- or 6-pin DIN socket, finding the mike line will be slightly harder. You'll have to first find the TX line, as before. Then while keying the CB transmitter, listen on another CB tuned to the same channel while you touch the remaining socket pins with your fingers. You'll find one pin that causes a definite hum in the other set. That's the mike or audio line.

5) In a relay switched CB, jumpering the common with the correct pin will key the TX. You can then use the hum/fingers method to find the mike line. Older relay switched rigs often used a small shielded cable at the mike socket containing the mike line ground. The newer generation (Cobra 140/142GTL, etc.) now uses electronic switching almost exclusively, and generally have 5- or 6-pin mike sockets where more than one pin may be grounded. Some President radios like the AR-144 get away with 4-pin sockets, but are still electronic even for SSB. (Diodes are cheap.) In any case, only four wires are needed.

Method #2 — Without Use Of An Ohmmeter

Without a VOM, you'll have to use trial-and-error wire jumpering. For electronic switching this is exactly the same as described above, without the benefit of already knowing the common connection.

Start jumpering any two mike socket pins together and see what happens. Suppose it keys the TX. Draw another sketch, marking both those pins that made it key the TX. Keep jumpering around until you hear a normal receive signal noise level. Note those pin numbers. You'll discover that one of the pins is common to both RX and TX.

For example, if pins 2 & 3 cause TX, and pins 2 & 4 cause RX, then obviously pin #2 is common to both functions. Therefore, #3 is the TX line, and #4 is the RX line. This leaves only pin #1 remaining. That must be the mike line. (By the way, this just happens to be the pin numbering for all Cobra radios.) The word "common" as we're using it means the same thing as ground or shield wire.

Relay switched radios will be slightly more complicated, unless you have an older type that uses a 3-pin mike socket. With the set turned on, attach a clip-lead to the BLACK power wire. (On old tube type sets, clip one end of the lead to any part of the metal chassis.)

Now start touching the other end of the clip-lead to the mike socket pins until it keys the TX. Write it down. Then use the hum/fingers method or look inside the radio to find the shielded audio cable, as before. By the way, if you're looking inside the radio, you can just as easily find the common or ground by noting to which socket pin the shield of that audio cable is attached. On a 4-, 5-, or 6-pin socket that's relay switched, those remaining pins are either unconnected, or possibly also grounded, which is another way of saying that more than one combination will key the TX.

Sometimes you need all four pins of the mike socket, even though it's a relay switched CB. (E.g., SBE Cortez.) In such rare cases, there will be voltage to ground on two pins instead of just one; touching either of those pins to common will make the lights go out or blow the fuse. In this case, you

need a separate set of mike switch contacts to wire it right. See Figure 4 again; most power mikes can be arranged this way.

Now that you know which mike pin on the CB does what, you must match those pins to the corresponding colored wires on the new mike. If the mike you want to wire isn't included, you'll have to figure out the color code yourself, which is very easy to do using an Ohmmeter. (On a power mike, the battery must be installed before the tests.)

The typical power mike will have three, four, or five colored wires and a shield braid. If one of the colored wires is obviously covered by the shielded braid, it's the mike or audio line. Otherwise, if you cut off about an additional inch or so from the main cord cover, you'll most likely see one wire that's wrapped with the shielded wire. Following are some typical examples.

Case #1 – 3 Colors & Shield

Touch one lead of the Ohmmeter (Rx1 scale) to the shield braid and the other lead to each color in turn. One color should show a short; i.e., 0Ω, that opens up when keyed. This is the RX line. Write it down.

Another color should show a dead short (0Ω, or continuity) when you key the mike, and open when the mike button is released. This is the TX line. The remaining color is obviously the mike or audio line. If you couldn't seem to find the TX or RX line this way, the mike is wired internally for relay switching. It will short two of the three colored wires on TX, rather than one color and the shield braid.

The mike or audio line can be found as follows:

1. On a straight dynamic non power mike, it will normally show a DC resistance of roughly 300Ω-1000Ω on the Rx10 or higher scale when keyed. You may also see this reading even when the mike is *un*keyed. This is definitely the mike line, as the TX and RX lines will show DC resistance of 0Ω.
2. On a power mike with the battery installed, the reading may vary anywhere from a few ohms to several thousand ohms, depending on the setting of the Mike Gain control. Many times you will note the Ohmmeter kick up, then slowly settle to a definite reading, as the capacitors in the mike amplifier charge up. (This kick is only when keyed.)

Note:
Many power mikes will show a mike line reading of a few ohms all the time until you key it. This indicates a normally closed audio line, a very undesirable feature. (A meter on the mike line will jump when you key it.) A normally closed audio line can be a real problem to wire to many CBs. It's usually done because the manufacturer was too cheap to use a switch with enough contacts on it to begin with. Ideally, the mike line should make a complete circuit only when you key it. All Turner mobile mikes work this way.

If you found the mike line OK, but couldn't get an indication of TX and RX continuity between the shield and one particular color, you have a mike that's wired internally for relay switching.

A quick Ohmmeter check after you find the mike line will reveal that you do get a complete circuit (continuity) between the two remaining colored wires, rather than one color and the shield. On many mobile and almost all base power mikes, there will be a miniature slide switch inside the mike or the base plate marked "E" and "R." Put it in the "E" for electronic position, and it will then show TX and RX continuity between shield and colored wires. Do this even if your CB uses relay switching. You can wire 99% of all CBs that use relay switching in the electronic position. The reverse isn't true; a mike internally wired for relay switching must be modified to use it on electronically switched CB radios.

Note:
Turner mobile mikes do not have the internal switch, although some of their base mikes do. If the Turner mike starts with the letter J, like JM+2, JM+3, etc., you're all set up for electronic switching.

If it doesn't have the J, you must make an internal wiring change on the switch. In other words, a Turner M+2 will connect the RED and BLACK wires when keyed; the WHITE is the mike line. The JM+2 though connects RED and SHIELD for RX, and BLACK and SHIELD for TX. WHITE is still the mike line. See the difference?

Generally speaking, it's much better to buy a mike wired for electronic switching. It can be easily rewired to another CB later just by stripping either of the switching wires and twisting it together with the shield as one wire. The remaining color then becomes the TX line for relay switched radios. You've reduced the four wires down to three and saved the hassle of having to open up the mike and rewire the switch itself.

Case #2 – 4 or 5 Colors & Shield

Here's a case where the manufacturer gave you enough wires to make all necessary switching functions. Usually, one or two of these wires will end up being unused and can be cut off when you solder on the plug. Let's say the mike has the following wires in the cord:

1. Red
2. Yellow
3. Blue
4. Green
5. Shield braid.

Step #1: Identify the mike or audio line. This will have the shield wrapped around it. If it doesn't, cut back another inch or so of covering; you'll find it. If not, use the previously described Ohmmeter method. You're looking for the wire that shows a kick or a definite resistance reading between it and the shield when keyed.

Step #2: It's very unlikely you'll find any continuity between shield and the remaining non-audio colored wires. Use your Ohmmeter to touch the remaining three colors with both test probes. You should discover that two of the three colors will short (show continuity) when keyed, and two of the three will short unkeyed. Therefore, one of those three colors is common to the other two colors, in exactly the same way we found the common on the mike socket itself.

Step #3: Strip back that common color and twist it together with the shield, making a single wire. Then solder them together. You'll now have one color left for RX, and one color for TX, when tested for continuity with the shield. You've thus reduced those five wires down to the four you need for electronic switching, or the three you need for relay switching. (In this case, also cut off the unnecessary fourth RX wire.)

To repeat as a practical example: assume from the above you discovered that YELLOW is the mike line, leaving RED, BLUE, GREEN, and SHIELD. You then discover that RED and BLUE make continuity when keyed, while GREEN and BLUE break continuity when keyed.
Therefore, BLUE is common to both RED and GREEN. You'd then strip and twist the BLUE to the SHIELD as one wire, leaving you with RED as TX, and GREEN as RX. (With relay switching, you could also cut off the GREEN wire.)

Note:
As previously mentioned, many power mikes and regular mikes come with a normally closed or shorted mike line. This can make it difficult or even impossible to wire to certain CB radios. This shows up as a loud buzz, squeal, or the receiver going dead when you plug the mike in. There aren't enough switch contacts to perform all the necessary functions, which include:

1. Connect RX or TX at the proper time.
2. Connect the audio line, ideally only when keyed.
3. Connect the power mike battery only on TX, so battery won't drain except when being used.

In many cases, installation of a resistor of about 4.7KΩ or more in series with the mike line will cure the problem. This you'd wire exactly the same way as the RF feedback squeal filter already described. You may have to experiment to find the proper value resistor. You'll probably notice a slight decrease in receiver volume if it becomes necessary to resort to this method.

Use the smallest value resistor that will prevent the RX from going dead or squealing. The mike should then work normally, and you probably won't even notice the volume decrease.

If you experience this problem when trying to wire certain brands of mikes, it's possible the mike cannot be wired to that particular CB. For example, the Astatic D-104 lollipop mike with the TUG-8 base stand uses a double pole, double throw T/R switch. If you had this wiring problem with such a mike, you couldn't wire the CB to it; you'd have to buy the TUG-S D-104, which uses a triple-pole, double-throw T/R switch. (And is also more expensive.) This problem is very rare though, and happens in maybe 5% of all mike wiring/CB combinations.

(continued on next page)

…from Pages 44–46

SOLID-STATE CONSTRUCTION

OK, let's look at the PCB, with all those strange little parts numbers and colors on the top side. Underneath, there's one big (usually) green-colored layer with little silver lumps all over the place where the parts were soldered. This bottom is called the "foil" side of the board. It's made of copper foil strips that were chemically formed into all sorts of strange looking shapes. The green stuff that covers most of the bottom area is called "etch resist" or "solder resist." This keeps the hot solder from sticking to areas where it's not wanted. If you carefully scrape away some etch resist from a foil with a razor blade, you'll see there's always some shiny copper under it.

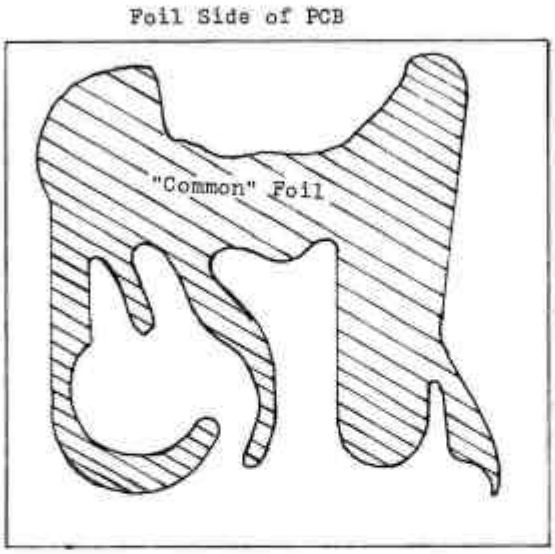
When trying to unsolder a PCB connection—or to even find the right one—a good strong back light is very helpful. I prefer the small penlight that uses two "AA" batteries and a #222 bulb. The #222 is a little pre-focused bulb that doesn't need to be mounted behind a glass window like other flashlights. Because of this, the bulb can actually touch the PCB and makes a stronger backlight. Strong enough to shine through the thickest PCB material. Some of the newer krypton penlights (Radio Shack #61-2536) are bright enough to do the same thing. To find the correct foil pad to unsolder, shine the light through either side of the PCB.

For many repairs you'll need to unsolder a part from the common PCB foil. "Common" here means the same thing as

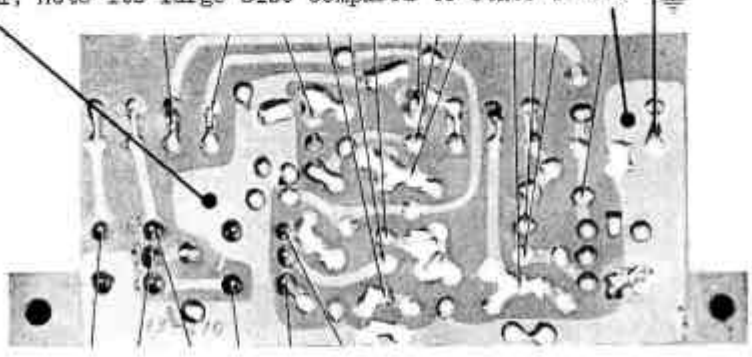
FIGURE 19

LOCATING TYPICAL "COMMON" FOIL

The Common Foil covers the largest area on the PC board. Note also there is no definite shape of foil surface.



Shown below is a portion of a PC board from a SAMS Fotofacts. The Common Foil is the one with the Ground symbol; note its large size compared to other foils.



-45-

Photo courtesy Howard W. Sams Co.

it back in the section on Mike Wiring. It's the common conductor for many circuits, and is always connected to the BLACK DC power wire somewhere. Using the VOM (with power OFF!) you'll always see continuity (0Ω) between the BLACK power lead and any part of the common foil. It's also the largest foil area on the board, wandering around all over the place. Figure 19 shows an example.

Base stations and many mobile CBs will often have other small PCBs bolted to the main PCB. The common foils on those boards will always be tied to the common of the main board.

You've probably figured out that all this "common" talk means the same thing as ground. That's mostly true. Modern CBs can be used on either positive or negative ground vehicles. The metal chassis of these radios won't show continuity between the case and the common foil. Why? Because the common foil here is "floating" on insulated mounting bolts. That's how it's able to connect to either positive or negative. To repeat: the common foil and the frame are not tied electrically in these units.

Exceptions to this rule include some old 23-channel Johnson mobiles, and all CBs designed for negative ground use only. These types have a *direct* electrical connection between metal case and common foil. Don't be too concerned about all this talk of positive/negative stuff; we'll show just what you need to know to fix the radio.

PROBLEM: RADIO IS DEAD. WON'T EVEN LIGHT UP. MAY OR MAY NOT BLOW FUSES.

A. FUSE PROBLEMS

What, you don't even ***have*** a fuse in the hot lead? Get one! In fact, if you were operating without a fuse, better skip ahead to **Section C** first.

Check the radio's fuse visually or by touching your Ohmmeter across the ends (any Rx scale), looking for an open circuit. If you powered the radio through a circuit in the vehicle's fuse block instead of directly from the battery, you might have blown that fuse instead. Check it out. Sometimes fuses blow for no apparent reason except old age. If you replace a bad fuse and the CB works again, you've solved the problem. Unless it blows again after the set's been on for a while, or when you key the TX, there's no need to even dig any further.

Caution!

Never, never, ***never*** use a fuse larger than 2-3 Amps in a regular solid-state CB radio! A few hybrid CB/Ham rigs with higher TX power (RCI 2950, HR2510, etc.) may use a slightly larger fuse. You can tell the amps by what's stamped on one end; it usually has a voltage rating and words like "AGC 2" on it. It's incredible how many people will stick a *10 or 20 Amp* fuse in the CB's fuseholder. Then they accidentally cross the RED and BLACK power leads, clouds of smoke pour out, and they wonder why!

A few 18-wheelers like the White Freightliner or other vehicles use a positive ground electrical system. In such cases, you'll also need a fuse in the BLACK power lead to protect the radio. But don't expect to find a CB with both RED and BLACK wires fused. Manufacturers are cheap, and they figure 99% of their radios will be used on standard negative ground vehicles anyway. For positive ground use, spend the $2.00 and install an extra fuse and fuseholder. It's cheaper than the repair.

B. BAD SLIDE MOUNT CONTACTS.

Sometimes the contact strips of mobile slide mounts have bad connections. The CB may go on and off when you hit bumps in the road or wiggle the mount. If the radio's completely dead and you have a cigar lighter power plug or a 12VDC converter in the house, see if the radio works on those. If so, the problem will be in the vehicle or installation wiring.

Grab that trusty Ohmmeter again. Use the "DC Volts" position. (Any range that displays 12VDC is fine.) Remove the radio from the slide mount. Touch the meter's RED and BLACK test leads to the matching RED and BLACK slide mount strips where they connect to the vehicle power. The meter should show +12 Volts. Depending on where you tied in to the car's hot lead, you may have to turn on the ignition key for this test.

If there's no voltage reading, you have a car fuse problem, a slide mount fuse problem, a fuseholder not making good contact between its two pieces, or possibly even a bad ground. You can check for a bad ground using any "Ω" scale again (power OFF!) and confirm there's continuity between the slide mount's BLACK wire contact and the vehicle body.

Suppose you do measure 12 volts on the bolted half of the mount. And you know the CB works on some other 12 volt source. The problem must then be in the slide mount contact strips. Carefully bend up the strips on both halves of the slide mount with a screwdriver or needle nose pliers to get more contact pressure. If the mount uses the flat strips that can't be pried up, melt solder on them to make them thicker. They should then mate more firmly and solve the problem.

C. MOBILES ONLY: BLOWN REVERSE-POLARITY PROTECTION DIODE. KEEPS BLOWING FUSES. WON'T EVEN LIGHT UP. (A 50¢ PROBLEM.)

This is the most common reason for dead mobile CBs. You hooked the RED and BLACK wires up backwards without a fuse, or with a fuse bigger than 2 Amps.

The repair is simple and cheap. To confirm that this is the problem, disconnect the power leads or pull the CB out of the slide mount. Connect the RED and BLACK Ohmmeter leads (Rx1 scale) to the RED and BLACK radio leads or [+] and [–] on the power socket. A blown diode will show a short of 0Ω. Reverse the RED and BLACK Ohmmeter leads, RED to BLACK, BLACK to RED. This should still show a short. If it doesn't, the diode's not the problem.

Depending on the radio's particular ON/OFF/VOLUME control wiring, you may need to turn the control on first (but power OFF!) for this test. On a few CBs the diode is wired *after* the ON/OFF/VOLUME control in the circuit, so you won't see the short until you turn the power switch on. If this diode isn't the problem, you'll always see a small resistance (10Ω-30Ω) with the RED and BLACK meter leads one way and the radio switched on. Reversing the meter leads will then show a very high resistance, in the thousands of ohms.

(continued on next page)

APPENDIX F
SPECIFIC POWER & MODULATION DATA

Shown on these six pages is peaking/modulation data for many of the most common 40-channel PLL radios. It's arranged alphabetically by PLL IC type. Check the main circuit of your set to determine its PLL. Then look it up here. Shown in **{ }** are the transmitter adjustments having the most effect on increasing power output, followed by the modulation control (AMC) for AM-only radios and the additional controls for AM/SSB or FM rigs. (ALC control for SSB, AM Carrier Power Control, FM Deviation Control, etc.) In some cases there is no AMC adjustment, but rather a limiting transistor, usually called "TR32," "Q301," etc. This part could be removed to boost modulation. Almost all the better radios have these parts clearly marked on the circuit board, so you should have no problem locating them. It will become very obvious that many radios are absolutely *identical* inside; the only difference is the outside appearance!

AN6040 See PLL02A

CCI3001
Pace 8093, 8193: {L12, L4, L3, L2, VR7}
Royce 582, 651: {T302, L303, VR201}
Royce 639, 642: {L12, L4, L3, L2, VR7-AMC, VR11-ALC}
SBE LCMS-4: {L12, L4, L3, VR7-AMC, VR11-AMC}
Sommerkamp TS310-DX: {L12, L4, L3, L2, VR7-AMC, VR11-ALC}

CCI3002
Kraco 2410, 2420, 2430: {L303, L304, VR201}
Pace 8003: {T302, L303, VR201}
Royce 607: {302, L302, R201}

C5121, C5122
Cobra 7 Ultra: {RF adj. unknown at press time; RV2-AMC}
Cobra 19+ (late): {L10-squeeze or spread turns; RV4}
Cobra 19DX: {L5, L6, L801, RV2}
Cobra 19 Ultra, 19LTD II: {L301, L302, L303, RV2}
Colt 357A: {L10, L11, RV4}
Contact 40FM: {T13, T14, T15, RV4-DEV}
Dick Smith D1200: {T9, L4, Q18}
DNT Contact 40FM: {adj. unknown at press time}
G.E. 3-5909A: {T2, T3, L7, Q13}
G.E. 3-5829B: {L12, L13, RV4}
Intek M4035: {adj. unknown at press time}
Lear Jet: {adj. unknown at press time}
MCE 40: {adj. unknown at press time}
Midland 77-094: {L6, L7, RV1}
Midland 77-106: {L10, 11, L12, RV4}
Midland 77-112, 77-114: {L10, L11, L12, RV4}
Midland 77-116: {L8, L9, RV2}
Midland 77-155, 77-157: {LX12, LX13, LX14, RV4}
Pearce-Simpson Cub: {adj. unknown at press time}
Realistic TRC494: {L5, L8, L9, Q14}
Realistic TRC495: {L6, L7, L14, VR7}
Realistic TRC499: {L701, L702, L801, RV2}
Regency Info CB-1: {L11, L12, RV4}
Regency Info CB-2: {L303, L305, L306, RV201}
Unic RV-CB40TB: {T10, L11, RV4}

F9316PC
Pace CB166: {L10, L14, L15, R207}
SBE 26CB/A, 32CB, 43CB: {L6, L8, L9, R4}

GREAT UK PLL Chassis
Academy 501, 502, Barracuda GT868, Elftone ELCB6000,
Fidelity CB300M, 1000M, Great GT858B, GT868B,
Halcyon Cheetah, Condor, Johnson XK2000, Lake 850, 950,
Sapphire 2000DX, Steepletone SCB1FM,
Transcom CBX2000, CBX4000: {L8, L11, R75-FM DEV}

HD42851
Sharp CB-5470: {L303, L302, R541-AMC, R542-ALC, C31-AM PWR}

HD42853 See µPD2814C

KM5624 See µPD2814C

LC7110
G.E. 3-5804A, 3-5871B, Sanyo TA2000/4000/6000,
Realistic TRC454: {L901, L903, L905, VR7}
Realistic TRC470: {L901, L903, L905, VR7}

LC7113
Realistic TRC459:
{L6, L9, L10, VR13-AMC, VR5-ALC, VR14-AM PWR}
Realistic TRC480:
{L7, L10, L11, VR13-AMC, VR14-AM PWR,VR5-ALC}

LC7120
Colt 222, Commtron VIII, Jaws II: {L304, L305, L306, RV201}
Formac 240: {adj. unknown at press time}
HyStar 100, Palomar SSB500 (late), Stag 357:
{L32, L30, VR7-AMC, CT7-ALC, VR8-AM PWR}
Midland 100M, 150M, 77-101B, 77-101C, 77-824C:
{L304, L305, L306, RV201}
Colt 510: {L304, L305, L306, RV201}
Realistic TRC462: {L11, VR3, L14, L15, VR2-AMC}
Robyn SB540D: {L451, L454, VR311-AMC, VR312-ALC}
SBE 47CB: {L11, KVR5, L14, L15, VR4-AMC}
Tristar 120: {L10, L11, L12, L13, R230}

LC7130/LC7131
Audiovox MCB40: {T11, T12, T13, T14, VR3}
Cobra 19X: {L304, L305, L306, RV201}
Cobra 19XS: {L205, L206, L207, RV201}
Cobra 19+ (early): {L304, L305, L306, RV501}
Cobra 20+: {L304, L305, L307, RV501}
Cobra 40+: {L304, L305, L306, RV104}
Cobra 66/67LTD, 70LTD: {L11, L13, L14, RV4}
Cobra 90LTD, Midland 76-300: {L303, L304, L305, RV201}
Colt 210: {L304, L305, L306, RV201}
Courier Galaxy IV: {L12, RV3-AMC, RV8-ALC, RV7-AM PWR}
Courier Galaxy V, Galaxy VI:
{L48, VR14-AMC, VR12-ALC, VR13-AM PWR}
Dick Smith D1450: {L206, L207, RV201}
Fox CB340: {L304, L305, L306, RV201}
Fuzzbuster Z-80: {adj. unknown at press time}
G.E. 3-5805B: {L304, L305, L306, RV201}
G.E. 3-5826A: {L7, RV6-AMC, RV2-ALC, RV7-AM PWR}
Intek 49+: {L304, L305, L306, Q202-AMC}
Midland 2001, 3001, 4001, 150M (U.S.), 101M, 151M,
202B, 202M: {L304, L305, L306, RV201}
Midland 103M, 77-001: {L205, L206, L207, RV201}

LC7130/LC7131, continued
Midland 75-790: {T8, L1, L3, D202}
Midland 77-225: {L11, L13, L14, RV4}
Midland 77-911, 77-915: {T8, T9, T10, Q101}
Pearce-Simpson Super Tiger, Super Lion Mk III:
{L12-RF, RV3-AMC, RV7-AM PWR, RV8-ALC}
Pyramid CB-24: {adj. unknown at press time}
Pyramid CB-26: {L14, L16, L17, Q19}
Realistic TRC421A, TRC422A: {L3, L6, Q12}
Realistic TRC410: {L4, L3, Q12}
Realistic TRC414: {L3, L6, Q10}
Realistic TRC428: {L5, L8, Q20}
Realistic TRC472: {L212, L210, VR204}
Roadmaster RE-6000: {T7, L7, RV4}
Roadmaster RE-8000: {T12, L5, RV3}
SAM 2000: {L304, L305, L306, RV201}
Unic RV-CB50: {L14, L16, Q25}
Uniden AX-11: {L12, L14, TR14}
Uniden PC77: {L16, L13, TR30}
Vice-President ROY: {L304, L305, L306, RV201}

LC7132
DNT 4000FM: {L2, L3, Q202}
G.E. 3-5828A: {L306, L307, RV4}
Fox CB240, CB440, G.E. 3-5806A, 3-5808A,
Midland 77-104, 77-805/805A: {L11, L12, RV4}
Midland 77-145, 77-145A: {L204, L206, L207, RV104}
Midland 77-149: {L10, L11, L12, RV4}
Midland 77-158: {L3, L5, RV3}
Midland 77-160: {L305, L305, L306, RV204}
Midland 77-250: {L303, L304, L305, L306, RV201}
Realistic TRC413: {L3, L6, Q10}
Realistic TRC415: {L10, L11, Q7}
Realistic TRC417, TRC418: {L10, L3, L1, Q19}
Realistic TRC419: {L305, L306, RV202}
Realistic TRC423: {L304, L305, L306, RV202}
Realistic TRC430: {L306, L307, RV104}
Realistic TRC433: {L4, L3, Q15}
Realistic TRC434: {L6, L3, L1, Q12}
Realistic TRC438: {L809, L811, RV804}
Realistic TRC482: {L304-307, Q201}
Realistic TRC492: {T11, L3, Q12}

LC7136/LC7137 UK Chassis, PCMA002F
Amstrad CB900, CB901, Fidelity 2001FM, Harrier CBHQ,
Harvard 400M, 402MPA, H401, H407, Mustang CB1000, 2000,
3000, 3001, Nato 40FM,Transcom GBX4000: {L4, L8, RV3-FM DEV}

LC7136/LC7137 UK Chassis, PTBM134AOX
Barracuda HP940, Binatone 5-Star, Speedway, Fidelity CB2000M,
Harrier CBX, Harvard 420M, Midland 76-200, Radiomobile 201, 202,
Rotel RVC220, 230, 240, Oscar 1, Sapphire X4000,
York JCP861, JCP863: {L4, L8, L9, RV2-FM DEV}

LC7137 UK Chassis, PTBM135AOX
Cybernet Beta 1000, 2000, 3000: {L7, L8, RV1-ALC, RV2-FM DEV}

LC7137 Misc. UK Chassis
Shogun CB: {L157, L154, VR7-ALC, VR8-FM DEV}

MAXON UK Chassis (LC7136/LC7137/MC3357)
Cobra 21FXM, Colt 295, Commtron CB40F,
Maxcom 4E, 6E, 16E, 20E, 21E, Midland 2001, 2001T, 3001, 4001,
Sirtel Searcher: {L13, L10, VR5-FM DEV}

LC7185
Alan 28, 38: {adj. unknown at press time}
Cobra 18RV: {L303, L305, L306, RV501}
Cobra 18 Ultra: {L303, L305, L306, Q502}
Cobra 21LTD-WX: {L16, L18, Q11}
Cobra 23+: {L303, L306, RV501}
Cobra 93LTD-WX: {L16, L18, VR3}
Cobra HH-35: {L6, L5, L801, RV2}
Maxon 2000: {adj. unknown at press time}
Midland 77-092: {L3, L6, Q14}
Midland 77-099: {L9, L10, RV4}
Midland 77-118: {L305, L306, RV501}
Midland 77-130: {T7, T8, T9, L11, VR3}
Midland 77-162: {L10, L11, L12, L13, RV2}
Realistic TRC437: {L7, L8, L9, L12, RV2}
Realistic TRC439: {L302, L303, L801, RV450}
Realistic TRC443, TRC444: {L104, L900, L901, RV450}
Realistic TRC464: {L5, L6, L801, RV2}
Realistic TRC476: {L303, L304, L305, L306, Q201}
Realistic TRC477: {L7, L8, L9, L12, RV2}
Realistic TRC481: {T9, L11, Q13}
Realistic TRC488: {L302, L303, L801, RV450}
Realistic TRC493: {T7, T8, T9, L12, Q3}

LC7230, LC7232, LC7234
Cobra HH-40: {L301, L302, L303, Q204)}
Cobra HH-70: {L5, L6, L801, Q12}
Midland 77-285: {T9, T10, L4, RV4}
Realistic TRC483: {L408, L409, L801, RV201}
Realistic TRC485: {T17, T18, L8, RV5}

M58472P
Channel Master CB6830, CB6832: {L903, L905, VR6}
G.E. 3-5800A, 3-5801A, Teaberry "T" Charlie: {L903, L905, VR7}
G.E. 3-5810A, 3-5871A, Teaberry Racer "T" (23 & 40-Ch.),
"T" Control (4009): {L903, L905, VR6}
G.E. 3-5821A: {L903, L906, VR10}

M58473P
American Motors 32311847, 848, 849, 850: {L304, L305, L306, VR303}
ITT 4400M, Wards GEN-702A, 730A, 774A, 775A, 828A:
{L208, L209, L210, L211, VR206}
Kraco KCB4005: {L402, L403, L404, VR201}
Royce 1-632: {L6, L4, L1, VR7-AMC, VR5-ALC}
Sears 280.6267: {L404, L403, L402, D404}

MB8719/MB8734 (by chassis type)
AM In-Dash Models
Cobra 46/47XLR, 50/55XLR: {L112, L109, VR105}
Midland 63-445: {L112, L109, VR105}

Single-Conversion AM/SSB U.S. Models
Cobra 140GTL, Cobra 142GTL, Courier Galaxy, Midland 79-900,
President P400, McKINLEY, WASHINGTON (late),
Realistic TRC450, TRC490, Robyn SB505D, SBE LCBS-8, LCMS-8,
Teaberry Ranger "T", Stalker IX, XV, XX, Tram D80, D300,
Uniden WASHINGTON:
{L36, TR32-AMC, VR7-ALC, VR6-AM PWR}

Dual-Conversion AM/SSB U.S./Australian Models
Cobra 148GTL, 148GTL-F, 2000GTL, 2010GTL-WX,
Pearce-Simpson Super Bengal Mk II, President GRANT (late),
MADISON (late), Uniden GRANT, GRANT XL, MADISON,
Stalker XX (export): {L38, TR24-AMC, VR11-ALC, VR10-AM PWR}