

100 More Channels for the Icom R-7000

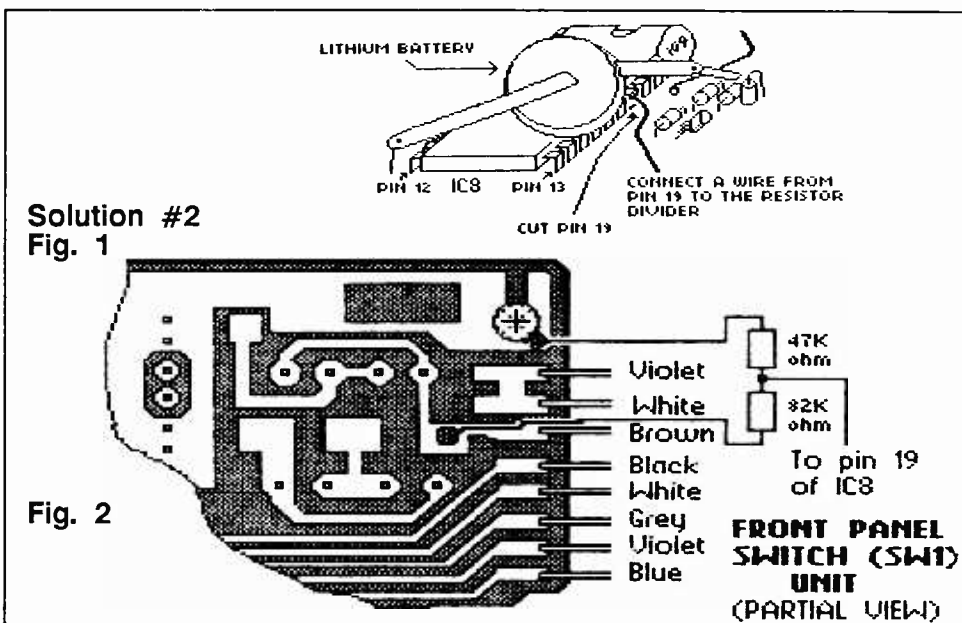
The Icom R-7000 is one heck of a good radio. Much more than just a scanner, the R-7000 microwave communications receiver is designed for the *serious* VHF/UHF listener. Frequency coverage from 25 MHz to 2 GHz and multi-mode operation makes the R-7000 a benchmark receiver.

As with any commercial receiver, there are some things that can be done to improve performance and make the receiver much more effective and efficient to use. In this month's Experimenter's Workshop, we'll show you some modifications to the R-7000 that will definitely improve this top-notch receiver.

As with any modifications to a piece of electronic equipment, they should be performed *only* by qualified electronic technicians familiar with soldering in hi-density circuits. In addition, the ICOM service/maintenance manual for the R-7000 is a must.

It tells the locations of all the parts, shows board locations, pictorials, and how to pull the receiver apart. It is the definitive source of information on the radio and well worth the investment. Anyone undertaking these modifications without the service/maintenance manual is asking for trouble.

How would you like an additional 100 channels of memory? A very simple addition of one resistor and a switch will enable an additional 100 memory channels. The second



bank of 100 channels cannot be scanned in sequence with the original 100 channels, but they will be available as a separate bank of channels that will double the existing memory of the R-7000.

Here's how it works:

1. Locate RAM chip IC-8 (uPD446C).
2. Cut the trace from pin 19 to ground (this

will leave pin 19 high).

3. Solder a 47 K (47,000 ohm) resistor from pin 19 to the 5 VDC buss appearing on pin 24 of IC-8.
4. Connect an SPST switch (toggle or push button) between pin 19 and ground.

When the switch is closed, it pulls pin 19 low and emulates the original configuration. With the switch open, pin 19 is pulled high and channels 100-200 are enabled. Now you have an R-7000 with 200 memory channels for less than \$2.00 worth of parts. Not a bad trade-off!!

Mounting this switch could be a problem. Drilling holes in a \$1000 radio is NOT the way to insure its resale value. With that in mind, we'll present another way to obtain these extra 100 channels.

Jack Albert checks in with this solution to obtaining an additional 100 memory channels. While it is similar to the aforementioned mod, it is a bit more detailed and uses the "Remote" button to shift to the new channel bank. If you have the remote controller option, RC-12, installed, you will have to control volume with the remote unit when the new channel bank is selected. So here's Jack's solution to the second channel bank addition:

Parts needed: one 47 K resistor, one 82 K resistor, and six inches of #20 gauge wire.

1. Remove the bottom cover of the radio and the logic board cover plate.
2. With the front of the radio facing you, locate the uPD446C RAM chip, IC-8.
3. Locate pin 19 which will be connected to ground along with pin 20. NOTE: the lithium battery may be in the way, so gently

Welcome to Column No. 1

Welcome to my first "Experimenter's Workshop" column in *Monitoring Times*. Allow me to introduce myself. My name is Rich Arland. I'm 43 years old, married to a terrific lady named Tricia who puts up with me, my crazy radio hobby, and my lunatic fringe friends.

I have been licensed as a ham radio operator (K7YHA) since 1963, and hold an Extra Class license. As a father of four, I had high hopes that my children would eventually obtain their ham licenses, but, alas, only Wendy (KB4UNT) has humored her father thus far.

In addition to low power (QRP) ham radio, I also enjoy SW Listening and DXing, and I'm a dedicated scanner fanatic. My faithful DX hound (a Golden Retriever pup named Ozzie) is a dependable alarm clock who awakens me around 4 a.m. every morning. He needs to make his morning constitutional around the yard which allows me time to check the SW bands for interesting DX.

Currently I'm working for the Student Loan

Marketing Association in Wilkes-Barre, Pennsylvania, as head of their technical services department. In 1987 I retired from the USAF after 20 years active duty in long-haul and tactical communications. Out of my 20 years in the Air Force, 15 were spent in exotic overseas locations including Japan, Azores, and England.

So much for the mini-biography. Now some words about the column. The main purpose of Experimenter's Workshop is to provide a technical information forum for hams, SWLs/DXers, and scanner buffs to enhance their involvement and enjoyment within the hobby. Each month we'll explore some topic of interest which will be of a technical nature.

My personal philosophy is that this is YOUR column. In order to make it succeed, I'm going to have to have YOUR input. If you have a modification to a radio (HF, scanner, or CB set), pass it along and we'll try to get it in print.

If you have a specific question, send that in also, and I'll give it my best shot and publish the answer for the benefit of all. To summarize, I need to hear from YOU to make this column a success. Don't let me down.

Monitoring Times invites you to submit your favorite projects for publication. For more information, contact Rich Arland, 25 Amherst, Wilkes-Barre, PA 18702

4. bend it until it clears pin 19 (see Figure 1).
4. Using small wire cutters, cut the pin 19 next to the PC board. You will need to solder to this pin, so don't cut it too close to the body of the IC. (NOTE: an alternate method would be to use an X-acto knife to cut the trace on the PC board between pins 19 and 20.
5. Locate the SW1 switch PC board (behind the row of switches that are on the left of the tuning knob). The remote switch is mounted on the lower right hand side of the SW1 PC board.
6. Connect the voltage divider circuit (made of the 47 K and 82 K resistors) to the PC board as shown on Figure 2.
7. Connect a wire to the junction of the two resistors and then run this wire to pin 19 of IC-8 and solder in place.
8. Re-install the cover plate and the bottom cover of the radio. This completes the mod.

Turn on the receiver and push the "Remote" button (the REMOTE LED should light) and rotate the memory select knob. You should see two decimal points and the memory number on the display.

Now enter a frequency using the keyboard, press the appropriate mode, and then the WRITE button as if you were programming a new radio. You can write in as many new frequencies as desired (up to 100) and they will remain in memory in the "new" channel bank.

Push in on the "Remote" button again (the REMOTE LED should go off) and turn the memory knob. Now you should see the frequencies and modes previously stored in the memory prior to the mod. This mod enables a second bank of 100 channels and really improves the performance of the R-7000.

Our final offering for the R-7000 is not a mod but a reprint of an ICOM service bulletin to cure problems in the DC to DC converter and display power supply. As with the previous two mods, this procedure should be undertaken only by experienced technicians who are familiar with soldering on hi-density circuit boards.

1. Remove the top and bottom covers from the R-7000.
2. Remove the front panel sub-assembly from the main chassis of the radio. NOTE: refer to the service/maintenance manual for details.



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3. Remove the DC to DC board and replace Q1 and Q2 with 2SC 2655 transistors (part #906-00385).
4. Replace R1 and R2 with 5.16 K ohm resistors (part #915-01173) and C3 and C4 with .001mf 50V ceramic caps (part #918-01500).
5. Re-install the DC to DC board.
6. Remove the display board.
7. Replace Q11 and Q12 with 2SC 2655 transistors (part #906-00385).
8. Replace R31 and R32 with 5.16 K ohm resistors (part #915-01173) and C13 and C16 with .001mf 50V ceramic caps (part #918-01500).
9. Replace the display board, re-install the

front panel sub-assembly onto the main chassis of the radio, and re-install the top and bottom covers.

This completes the upgrade to the DC to DC converter board and the display board which should prevent any failures. My thanks to Jack Albert for providing the excellent modifications for this radio.

That's a wrap for this month, gang. Be back next month with some more good stuff. In the meantime, if you have a favorite mod or idea that will fit into this column, don't hesitate to write and we'll try to get it into print for all to use. 73s es Gud DX.

