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THE WORLD SCANNER REPORT

A Journal of VHF-UHF Scanner Technology & Engineering

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BAD & MEDIOCRE NEWS: PRO-35 & PRO-37

What do you want first, the bad news or the so-so news? Let's go for the bad stuff, first. It's common knowledge now that the new Realistic PRO-35 is little more than a relabeled BC-100XLT. The PRO-35 CPU has some changes in its hard programming and there are cosmetic differences but the PRO-35 is still a BC-100XLT in disguise. Nothing to rant and rave about there and no reason to run out and buy one, either. In case someone offers you a PRO-35 for free the main differences between it and a BC-100XLT are: Any channel can be Priority; one "Monitor" channel is for temporary storage of a freq found in the SEARCH mode; has both UP and DOWN SEARCH keys; battery pack can be charged separately from the scanner which can also operate from a separate power supply; has a BEEP function; has the full AIRCRAFT BAND of 108-136 MHz. That's about all worthy of mention on the PRO-35 except its hefty price tag of $230, while the BC-100XLT is about $40 less.

The news on the coming PRO-37 is a little better since it remains a PRO-34 with apparently all functions and specs intact. The PRO-37 is much faster than the PRO-34 at 26 ch/sec, otherwise it's the same radio. The increase of speed is due to a faster CPU along with a faster Clock Oscillator. The rest of the circuit should be about the same, including cellular restoration potential, but we'll have to wait and see for sure on that one. Not sure yet. Release of the PRO-37 should be in mid-September.

GOVERNMENT MEDDLES WITH RIGHT TO MONITOR THE AIRWAVES!

This is a little better than hearsay, but no confirmation yet....that a House Subcommittee is preparing a bill to direct the FCC to forbid importation or manufacture of any radio with capability to receive the cellular bands. This bill will also forbid convenient & easy restoration capability in the scanner. This could apply to the likes of the PRO-2004/5/6/2022/34 and BC-200/760/950/800XLT in which the deliberately blocked CMT bands are readily restorable. The bill appears to be at the behest of the Cellular Mobile Telephone Industry and there is rumored to be a clause in the bill which would keep the ban in effect ***until if and when the Cellular Industry no longer objects to CMT-capable scanners & radios***! John Dingell's name has been associated with the committee that's preparing this bit of invasive legislation. You may want to investigate because if government is allowed to legislate this sort of horse-manure, then there's no way to stop it from dictating what else we can and can't have in the way of receiving equipment. Time was when only transmitters & transmissions were regulated. Tradition long had it that the Right of the People to detect and receive the air waves was not to be infringed. Tradition was weakened with the ECPA of 1986 and now look what's coming down! Iron-Curtain Europe, Asia & other oppressed peoples have long been proscribed from possessing certain kinds of receivers. Maybe NOW is the time to plan your monitoring post for the years to come! Today's equipment might eclipse that of tomorrow's in utility and value!

Figure there's a couple of million of us scannists in a nation of 250-million, so as this legislation progresses through channels, there will be 248-million people who don't care one way or another; and 1,750,000 of the rest of us won't have heard about what's going on until it's too late. The quarter of a million of us left will be quite impotent to do anything about it. Look at it this way: s'pose you heard that knitting needles and anchovies were going to be banned. Would you care or be overly concerned? Probably not. That's the way most of America will be as the Right to Receive is ground into mincemeat. Oh, I forgot....there never was any such right in the first place..... If you want to know where I stand on this and related matters, here 'tis:

They can have my guns, my radios and my computer keyboard only after they pry 'em loose from my cold, dead fingers but they can have my pork chop & corn bread from yesterday's dinner absolutely for free..... /bc

NEW SUBSCRIBERS NEEDED!

We need new subscribers and I have exhausted all known avenues of publicity and advertising. I'm open to new ideas and suggestions for how the circulation of the ***"WORLD SCANNER REPORT"*** can be increased. Your input will be welcomed. There is something you can do, anyway: please tell your friends, associates and fellow hobbyists about us! I've long leaned on the values of good will and word of mouth. If you like the ***"WSR"*** , tell others. The rest will take care of itself. We're doing pretty good on growth as it is, but this next year is critical as to offering any guarantees of survival for the coming years. We need to do very well over the next twelve months to carve out a niche. The modifications and technology to be developed and the material to write up is there; now where are the Readers and the Hackers?

RADIO SHACK'S 1992 CATALOG OUT!
NEW AMPLIFIED SPEAKER & OTHER GODDIES!

Check out the new 1992 Radio Shack Catalog which just hit the stores! Lots of new goodies including an excellent amplified speaker, #21-541, on page 67. What a novel product, except that it is almost a carbon copy of Project #2 in Vol-2 of my SCANNER MODIFICATION HANDBOOK on pages 71-73! Gosh, I'm not so conceited as to think

great big Radio Shack copied the design from little ol' me, but sure as tootin', it's a monstrous coincidence! No matter whether the sorry rascals copied my design or not, that new amplified speaker is a heck of a good deal for handheld scanners and other audio environments where the volume just isn't up to snuff. The price is a decent $23.95. The basic unamplified speaker, #21-549, costs $13.95 and about $10 more is needed to make your own from my Project #2 anyway, and which might not end up as good, so put #21-541 on your budget if you need general purpose audio amplification.

The new PRO-37 handheld scanner appears to be a clone of the PRO-34, and while I haven't examined the schematics yet, I'll venture the educated guess that the primary difference between it and the PRO-34 is a faster CPU and Clock Resonator. This was, as you will recall, the main difference between the PRO-2006 and the earlier PRO-2005. So in essence, owners of the PRO-34 need only change CX-1 to something around 7 MHz to achieve near parity with the new PRO-37. An inherent problem of this method is that the DELAY function will decrease by the same proportion as the speed increase, so to achieve full parity, you'll need to replace the PRO-34's CPU with one for the PRO-37 as well as the Clock Resonator. I have proven this to be a viable upgrade for the PRO-2005 and it's probable that it will work for the PRO-34 as well. By next issue, I will have reviewed the schematics and will give you a full report at that time.

A couple of new base scanners are in the 1992 catalog, the PRO-59 and the PRO-58, but these are low-end entry level models not worthy of further mention here. In addition to the new PRO-37 and PRO-35, there are other new handhelds, the PRO-42 and PRO-41. Neither of these merit close attention, though if someone were to give you a PRO-42, it might make for a useful third-string backup to your backup handheld scanner. Nothing more. Bottom line is that only three scanner from Radio Shack are serious enough to capture your interest: PRO-2006; PRO-2022 and the PRO-37. PRO-34's are on clearance sale.

The new DX-390 Shortwave Portable Receiver heads page 51 just above the proven DX-440. The DX-390 doesn't appear to have all that much more than the DX-440, but with a 45 channel programmable memory, it costs $40 more than the DX-440. Might be worth a look at $239.95. Looks like the DX-440, same as the Sangean TS-803A, is here to stay for another year at $199.95.

LAST CALL - - WORDS TO THE WISE: Discontinued for 1992 are Radio Shack's double-shielded 25-conductor and 9-conductor computer LAN cables, #278-776 & 278-775. Pity because these cables contain the finest hookup wires you ever used in all your natural-born days. The brighter side is that they're on sale at over 50% off, so stock up! Radio Shack's regular spooled hookup wire isn't worth the powder to blow it to Kingdom Come. The insulation drips off like candle wax when the wire is soldered and it's not as flexible and workable as the wires salvaged from the above computer cables. This computer wire is ESSENTIAL for long term reliability and success with my Memory Modifications including the one that's introduced in the next column!

FEATURE PRESENTATION

25,600 PROGRAMMABLE CHANNELS FOR THE PRO-2004/5/6
12,800 PROGRAMMABLE CHANNELS FOR THE PRO-2022/2021/34/32
6,400 CHANNELS FOR THE BC-760/950/590/600 & R-1600

My exhilaration over the 6,400-Channel Extended Memory Modification (MOD-16 in Vol-1 of the SCANNER MODIFICATION HANDBOOK) had hardly subsided before I got to wondering if even more were possible. Right away I learned that two or more static RAM chips can be stacked with the CE (Chip Enable) pins on a switch. ***(See last month's "Modest Memory Upgrade" article.)*** That approach to doubling the 6,400-Channel Mod didn't turn me on because extra switching and space were required, not to mention almost double the work and cost to double the channels. And, shucks, if 6,400 channels weren't enough, then that would be like saying that a Rolls Royce isn't good enough. So I didn't get serious over that idea. But later I discovered that the 6,400-Channel Mod wasn't good enough in another area; the number of Blocks!

Aw sure, if you're used to one Block of 400 channels in a stock PRO-2004/5/6 and suddenly find yourself basking in the sheer luxury of 16-Blocks of 400-channels each, you might reasonably figure THAT will be good enough for a long time. Add it up: suppose you allocate the Home Block 00 and Block 01 for general operations. Then allocate another couple of Blocks for the Fed Gov't; one each for Local Gov't; Fire, Medical; Aero; Military Aero; Other Military; Transportation; Marine; Ham; CB/Freeband; Cordless & IMTS Phones; Broadcast & Media; Sports; Space; special events; a couple of Blocks for misc & scratch pad operations; and 2 or 3 Blocks for SEARCH & STORE ops, and ...oops....we've used up all sixteen Blocks even though we're not close to filling all 6,400 channels! Even the Mighty 6,400-Channel Mod can stunt your growth if you are sedate about maximum utilization and organization of the scanning & monitoring process. This scenario is a bit worse for the PRO-2022/2021/32/34 where you still get 16 Blocks but only 200-channels per Block; and worse still for the BC-590/600/760/950 & R-1600 where you still get sixteen Blocks but only 100-channels per Block. So I had to get serious about memory expansion again because I had run out of Blocks and organization space.

The 6,400-Channel Extended Memory (3,200 Channels for 200-ch scanners and 1,600 Channels for 100-ch scanners) calls for a 32k x 8 (256k) static RAM chip to replace the scanner's stock 2k x 8 (16k) SRAM. You can thus see how the mod multiplies the stock capacity by 16. The stock SRAM chip has 11 binary address lines (A0 - A10) which means the number of addresses is 2^{11} or 2,048 (2k), and each address hold an 8-bit "word" or code, so 2,048 x 8 bits = 16,384 bits (16k). The 256k memory expansion chip for MODs-16/19/37 has 15 address lines (A0 - A14) for 2^{15} or 32,768 x 8 = 262,144 bits. The only "glitch" about

this mod is actually one of its strong points in that the CPU addresses only 2^{11} registers, so by adding 4 switches, either DIP as in MOD-16/19/37 or electronic as in MOD-28, we have 2^4 (16) manual combos that can be addressed by the CPU; hence the 16 Blocks of 400, 200 or 100 channels, depending on your scanner.

Heck, 6,400 channels was plenty and would have stayed plenty if I could have figured out how to get more Blocks and Banks with fewer channels in each. Unfortunately THAT aspect is governed by the CPU, the mysteries of which are still elusive and unbreakable. It wasn't a greater number of channels that I needed; rather, more Banks & Blocks with a minimum of extra complexity, cost, effort & space. Well, I found it in spades with a bonus of up to 25,600 channels for the PRO-2004/5/6; 12,800 channels for the PRO-2021/2022/32/34 and a "measly" 6,400 channels for the BC-590/600/760/950XLT and the Regency R-1600! But again now, the emphasis isn't on the number of channels if you have two or three thousand. Instead, it's the number of Banks & Blocks that's most important. By now, you've probably figured out that my 25,600-Channel Mod offers 64 (sixty-four) Blocks! (2^6) In effect, this is like having 64 scanners lined up side by side, with the only limitation being that one at a time can be used. Big deal. Well, 64 Blocks of 400, 200, or 100 channels is a BIG DEAL, and it is no more difficult to add to your scanner than any of my MODS-16/19/37. Here is what you face if you're interested so far:

Starting from scratch, the work is about equal to that of MODs 16/19/37. Cost will be slightly more since the new 1-Meg SRAM chip costs about $35-$50, depending on where you get it. Parts count increases only slightly to negligible, depending on the switching method selected, either the manual DIP switch or MOD-28, Keyboard Memory Block Controller (KMBC). Here are the differences of this mod from MODs-16/19/37 in my books:

1. The new 1-Meg SRAM chip & Extended Memory Board (EMB) that you build will have 32-pins instead of 28, but the same number of wires (24) still go to the scanner and only two more address wires are needed, (6 total) either for the manual DIP Switch or the KMBC. Pin 1 of the 1-Meg SRAM is not connected to anything, and Pin 30 has only a 10-k resistor (R-7) to Pin 32, so this accounts for the extra pins.

2. The pinout of the 1-Meg SRAM chip differs from that of the 256-k SRAM, so the exact wiring of the EMB to the scanner's Logic/CPU Board will differ from that given for MODs-16/19/37. See Figure 1 in this issue.

3. DIP Switch Method: 6-pos DIP Switch and two more resistors needed. (R-5 & R-6)

4. KMBC Method: Two more resistors (R-9 & R-10) & LEDs (16 & 32) needed & minor wiring changes of the KMBC circuit necessary. See Fig-2 in this issue.

And that's it, folks; If you have not done an Extended Memory modification yet and are faced with the choice of MODs-16/19/37 or this new version, you may as well select this one unless the slight extra cost is a factor.

WHAT TO DO AND HOW TO DO IT

First, gather what you need. You should have both Vols 1 & 2 of my SCANNER MODIFICATION HANDBOOKs because lots of good tips for assembly and installation are included there for which space is not available here. Don't forget the Service Manual for your scanner! Next, you'll need a 1-Meg SRAM chip organized as 131k x 8, though it might be called a 128k x 8, of which there are several mfgrs & part no's:

NEC	uPD431000A-10L	or -12L or -15L
Sony	CXK581000P-10L	or -12L or -15L
Hitachi	HM628128LP-10	or -12 or -15
Motorola	MCM6226	
SGS-Thompson	MK48128-55	or -70 or -85

There are probably many sources for the 1-Meg SRAM chip, but my favorite, DIGI-KEY, doesn't seem to carry them yet so call EASY TECH at (800) 582-4044 and order their part number, 618128LP10, at $32.95. EASY TECH is an up and coming supplier, similar to DIGI-KEY so get their catalog and compare prices on other items, too.

Everything else you'll need is common and is listed in my books or in Figs 1 & 2 in this issue. Build the EMB as generally described in Vol-1 of the SMH and with specific variations as shown in Figs-1, 3 & 4 herein. Select your Block Switching scheme and if DIP or toggle switches are desired, follow the switch diagram in Fig-1. If you want to go for the neater, factory-like KMBC, MOD-28, see Vol-2 of my book and Figs 2, 5 & 6 herein. The only difference in the KMBC here from that in Vol-2 of my book is that the grounds are removed from U-3, Pins 11 & 13, and wires are connected between U-3, Pins 11 & 13 to U-2, Pins 13 & 14. R-9 & R-10 are connected to U-3, Pins 10 & 12 to drive the two new LEDs. Figs 2 & 5 make this clear.

KMBC Discussion

The Keyboard Memory Block Controller is a neat method of Block selection which requires no switches! You only press two keys on the Keyboard (CLEAR & PRGM) at the same time to activate the Block Sequencer. Other scanner functions remain undisturbed! Four LEDs are used with MOD-16 to indicate which of the 16 Blocks is selected. The KMBC is upgraded here for six LEDs to indicate which of the 64 Blocks is selected. Contrary to Vol-2 where I suggested that the KMBC & EMB can be built on one board, well I suppose they can, but I don't recommend it now. I have had nothing but success with two separate boards, and if it ain't broke, let's don't fix it. Besides, two small boards install a heck of a lot easier than one larger board. As suggested in my books, the EMB and KMBC should be installed in the PRO-2004, side by side, on the bottom of the chassis, between the power transformer and the front panel in the bare chassis space there. For the

PRO-2005 & 2006, the best and ONLY place to install the boards is vertically on the chrome-metal shield of the Logic/CPU Board in the front panel. See page 89 in Vol-2 of my book and the discussion there for how to do it, except since writing the book, I prefer to reverse the KMBC and EMB from the positions shown and move both closer to where the stock memory chip was removed. Both the EMB and the KMBC must not standoff from the chrome metal shield more than about 1/8", and 1/16" is even better. This is to keep the boards from touching the main receiver board when the front panel is swung back into position. I think Figs-2, 5 & 6 will make construction and assembly of the KMBC rather straight-forward and easy enough. When looking at Figs 5 & 6, please understand that I built that board expressly for this article so that it could be xeroxed with maximum clarity. You might find a better way to do the layout and wiring if you study the Figures closely. If you're a novice at this sort of thing, then copy my work. When the KMBC is completed, be sure to first TEST IT using the procedure given in Vol-2, pages 145-147.

Since this mod offers 64 Blocks of Memory, the speed of the KMBC becomes an important factor. I designed the KMBC (MOD-28) to plod along at about 2 Blocks per second which takes about 8 seconds to go from Block 00 to Block 15. Not too bad. But at that rate about 32 sec will be required to go from Block 00 to Block 63; ungood! So we need to speed this baby up by a factor of 4 or so, and even though 8 Blocks/sec seems too fast for convenience, it really isn't! You will get used to blazing speed after a while and appreciate it. Here is how speed of the KMBC can be changed: Instead of C-2 in Fig 2 being the "normal" 2.2-uF (2 Blocks/sec), try 1.0-uF for about 5 Blocks/sec or better, 0.68-uF for about 7 Blocks/sec. 0.5-uF yields about 8 Blocks/sec. When you want to get from a low numbered Block to a high one fast, just press & hold the CLEAR & PRGM keys until the count gets close; then release the PRGM key while still holding the CLEAR key, just tap the PRGM key to advance one Block at a time until you hit the desired one. Easy!

DIP SWITCH or TOGGLE SWITCH Discussion

Little to say here. Figure 1 and MOD-16 in Vol-1 of my book are quite self-explanatory. All switches are OFF for the "Home Block" position. Resistors R1-6 can be as high as 100-k, if you like, though 56-k is specified. The biggest problem with the DIP or Toggle Switching methods is WHERE to install the switches. If you use DIP Switches, for Pete's Sake, install a DIP socket so that the switch can be removed at times. A 14-pin DIP socket can be trimmed to 12 pins for this purpose. The DIP socket is best installed in the PRO-2005/6 on the front panel vertically between the LCD Display and the MANUAL & SCAN keys. You'll have to remove the Logic/CPU board to access the inside of the front panel, but so what? Vol-2 of my book explains in detail how to do this. If you opt for toggle switches you're more or less on your own here. Micromini toggles can be installed in the horizontal groove below the LCD Display on the 2005/6 but this area is best reserved for my LED S-Meter and LED Center Tuning Meter mods. If you don't want these mods now, you might later! Some hackers have installed toggle switches on the top case, but this restricts easy removal for future modifications & maintenance, so don't do that.

In the PRO-2004, the DIP Switch socket can be mounted in any of a dozen places on the front panel, so look around and pick your poison. Nothing critical. Same for toggle switches, though again, I don't recommend them.

It's been so long since I've been in a PRO-2022 and a PRO-32 that I can't remember the best places where to install things, but the -2022 has loads of space in which to work, so there should be few problems. The PRO-32 and the PRO-34 will require a metal box to be installed on the bottom end of the scanner, typical of the photos in Vol-1 of my book for MOD-19. An ideal box is made by LMB, Model #M00. It measures 2 1/4"L x 1 1/2"W x 1 3/8"D and is finished in black. The KMBC is not really suited for handheld scanners yet, (too large?) so DIP Switching is the best approach. The DIP socket can be made to fit on the little metal box quite easily. Again, see the photos under MOD-19 in Vol-1 of my book.

INSTALLATION FOR OTHER SCANNERS

I've never installed the 6,400-ch or 25,600-ch Extended memory in the PRO-2021, BC-760/950/590/600 or Regency R-1600, though I know this mod will work for them. In any event, I can't offer installation clues for that reason. Some of our readers have done multi-thousand Extended Memory Mods to the above scanners. If someone will write up the results of their experiences, and if interest warrants, I'll be glad to allocate some space in the ***"WORLD SCANNER REPORT"*** for these other scanners.

How To Determine the Block Numbers

Easy, if you know binary numbering. Still easy, if you don't. First, set up to the Home Block 00 with all DIP Switches OFF or all LEDs OFF. Then program something into Channel 1 that ends with xx00.000 to signify Block 00. In the PRO-2004/5/6, use 1000.000. For the PRO-2022 /34, use 800.000. For all others, use 400.000. Now advance the KMBC so that the first LED comes on, or turn on the DIP Switch that's farthest to the right (#6). Now select Channel 1 again but program in xx01.000 to signify Block 01. Repeat this process using Table 4-16-4 on page 141 in Vol-1 of my book, except where it ends at Block 15, you just keep on going until you reach Block 63 which for the PRO-2004/5/6, Channel 1 should be programmed with 1063.000 (or 863.000 or 463.000, etc).

Bear with me for a wrap up of the binary system: imagine six DIP Switches or six LEDs in a horizontal row numbered from left to right with 6 down to 1. The farthest right (#1) has a decimal value of 1 if ON and 0 if OFF. All have a value of 0 if they're OFF, but if they are ON, then decimal value are: #2 = 2; #3 = 4; #4 = 8; #5 = 16 and #6 = 32. Add up the values of each ON switch or LED

to determine which Block is selected. For example, if no's 6,5,2 & 1 are ON, the value is 32+16+0+0+2+1 = 51. This is another way to know which Block you're in without referring to the preprogrammed Channel 1 identifier code.

SUMMARY OF WHAT TO DO

1. Using a 32-Pin DIP socket, build the Extended Memory Board in accordance with Figure 1, with resistors R1-6 if DIP Switching is desired, or without R1-6 if the KMBC is to be used; R-7 is required for either; don't forget C-1. Wires on EMB should be 8" long to start with; trimmed to size later. Use perf board; PCB not worth it; but stick to the dimensions shown in Figs 3 & 4. Do not insert 1-Meg SRAM chip at this time.
2. Build the KMBC or the DIP Switch arrangement. Test the KMBC before proceeding. See Vol-2 of my book.
3. Remove the scanner's stock 2k x 8 SRAM chip, a 24-pin flat pack, surface mount chip. Use care, plenty of desoldering wick and low heat.
4. Mechanically install the EMB and either the KMBC with LEDs; or DIP Switch arrangement.
5. Connect KMBC or DIP Switch wires A thru E to the EMB, locations A thru E. (See Figs-1&2). Referring to the Service Manual for your scanner, connect KMBC power wire to scanner +5 volts, but NOT CPU +5v. You don't want the KMBC drawing "memory power". Use the main +5v regulator in the scanner, or add a 7805 or 78L05 of your own if in doubt or if the scanner doesn't have one. For the PRO-2004/5/6, proper +5v power is at the output of IC-8. NOTE: the DIP Switch arrangement is powered from Pin 32 of the SRAM chip, but don't power the KMBC from that point! That's CPU +5v!
6. Solder the wires from the EMB according to Fig-1 to the pin pads of where the stock SRAM chip was removed. This is the same wiring arrangement for ALL SCANNERS, so watch for errors; take it one step at a time, and be sure of every connection before going to the next.
7. Insert the SRAM chip into its socket and proceed with checkout & preliminary setups given in Vols 1 & 2 of my books. If all is well, you're on your own into a new dimension of scanning.

If all is not well, I will be delighted to assist you with troubleshooting and diagnosis of the problem, either by mail if you include a SASE and one loose extra stamp with a detailed request, or on-line via several Computer BBS services including GEnie's Radio Roundtable; the Shortwave/Scanner Echo of the FidoNet, the CIA BBS, (619) 273-6339, or the Interface BBS, (619) 297-7733.

If you are not happy with the referrals to Vols 1 & 2 of my books, please understand that I'm referring to nearly 60-pgs of detail that cannot possibly be reprinted in the space available here. If I were to do that, complete with all the photos, drawings and Tables, we'd need the next six or seven issues in which to do it all....and THAT, dear readers, would not be fair to YOU nor to those who aren't interested in this mod. Besides, 98% of YOU already have my books, so my referring to them is the correct thing to do for the benefit of almost everyone.

FIGURE 3: COMPONENT SIDE OF THE EMB (MOD-16A)

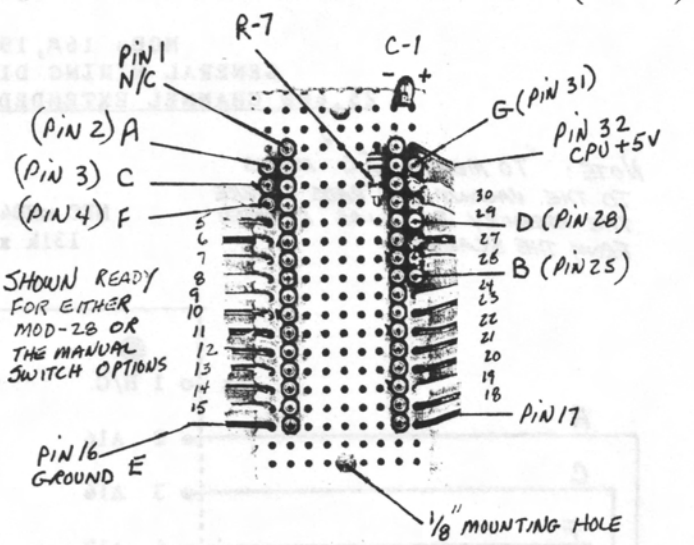


FIGURE 4: SOLDER SIDE OF THE EMB (MOD-16A)

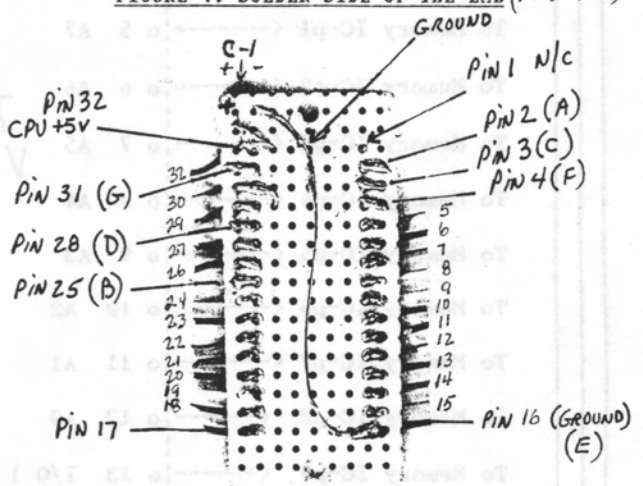


FIGURE 5: COMPONENT SIDE OF THE KMBC (MOD-28A)

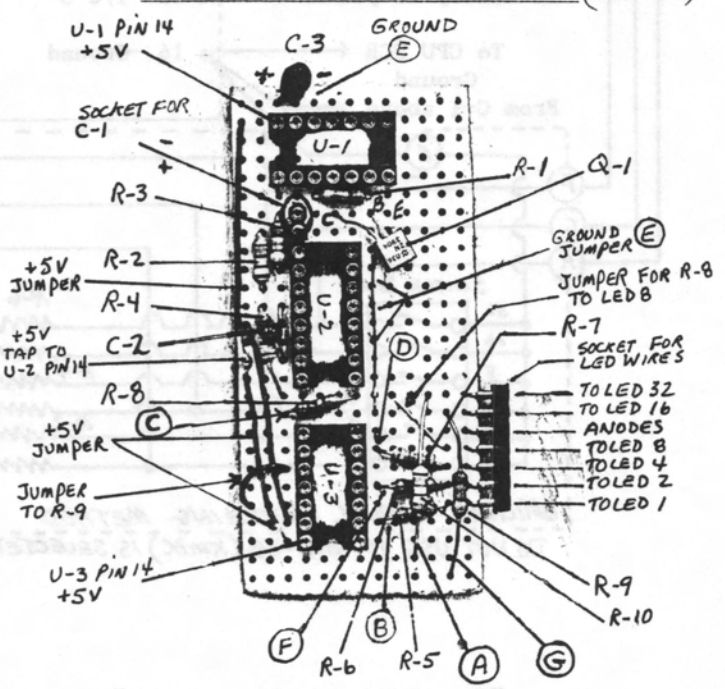


Figure 1

MODs 16A, 19A, 28A & 37A
GENERAL WIRING DIAGRAM FOR UP TO
25,600 CHANNEL EXTENDED MEMORY MODIFICATIONS

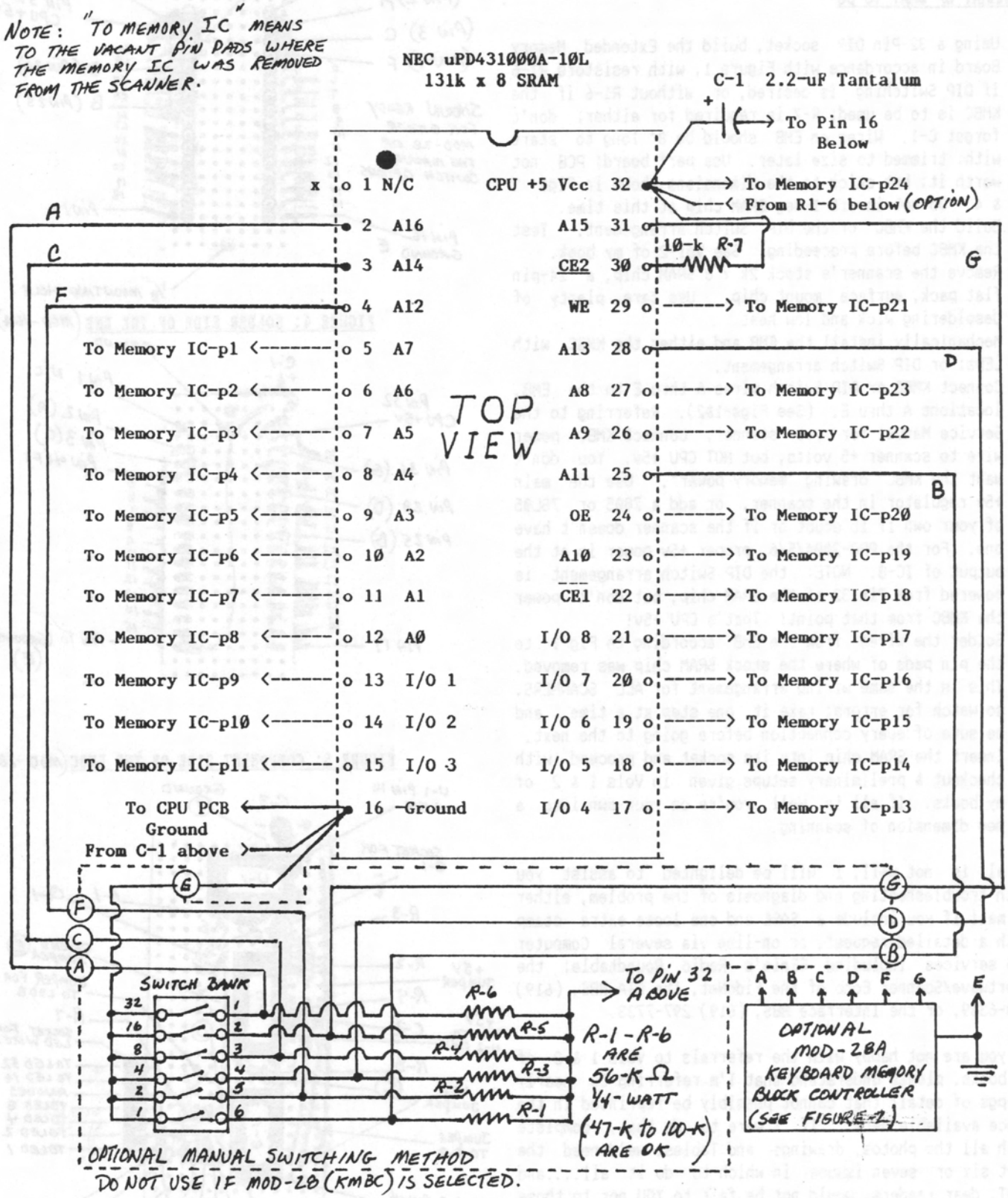
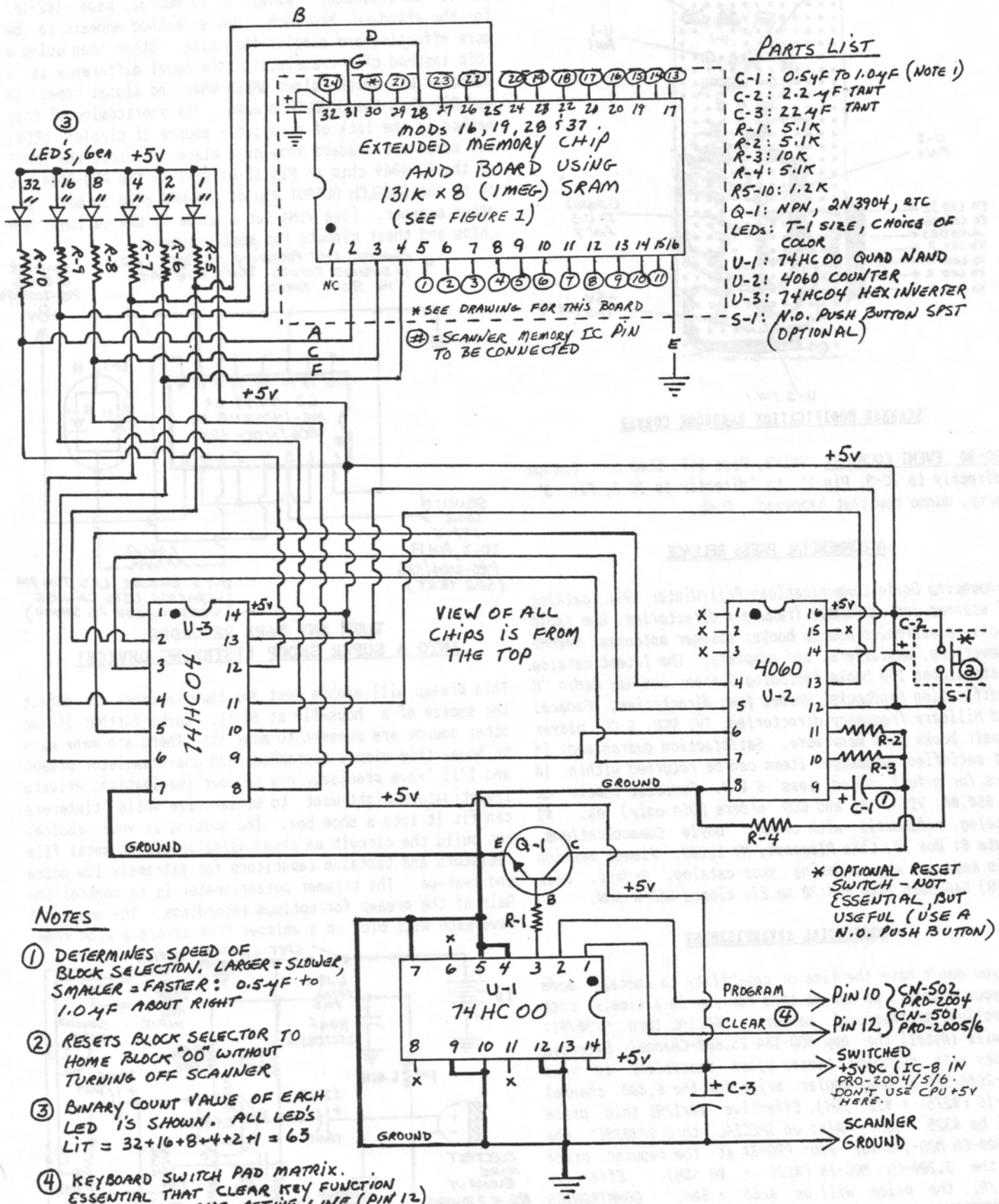


Figure 2

KEYBOARD MEMORY BLOCK CONTROLLER (MOD-28A) FOR 64-BLOCKS



NOTES

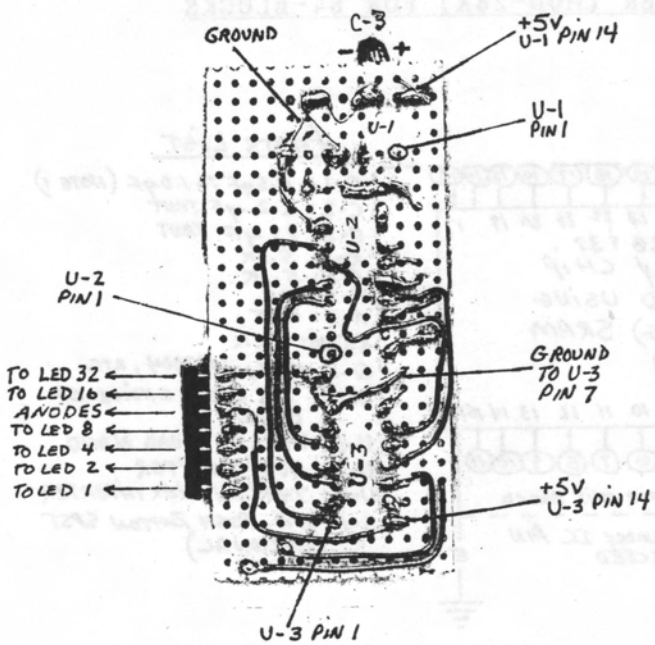
(1) DETERMINES SPEED OF BLOCK SELECTION. LARGER = SLOWER, SMALLER = FASTER: 0.5µF to 1.0µF ABOUT RIGHT

(2) RESETS BLOCK SELECTOR TO HOME BLOCK "00" WITHOUT TURNING OFF SCANNER

(3) BINARY COUNT VALUE OF EACH LED IS SHOWN. ALL LED'S LIT = 32+16+8+4+2+1 = 63

(4) KEYBOARD SWITCH PAD MATRIX. ESSENTIAL THAT CLEAR KEY FUNCTION BE USED FOR ONE ACTIVE LINE (PIN 12) BUT 9, 10 OR 11 CAN BE USED FOR THE SECOND ACTIVE LINE. (10 IS BEST)

FIGURE 5: SOLDER SIDE OF THE KMBC



SCANNER MODIFICATION HANDBOOK CORNER

MOD-30 EVENT COUNTER: Vol-2, Page 169, Step 5: Change "*directly to IC-3, Pin 1*" to "*directly to IC-3, Pin 3*". Sorry, dunno how that happened. Dumb.

A COMMERCIAL PRESS RELEASE

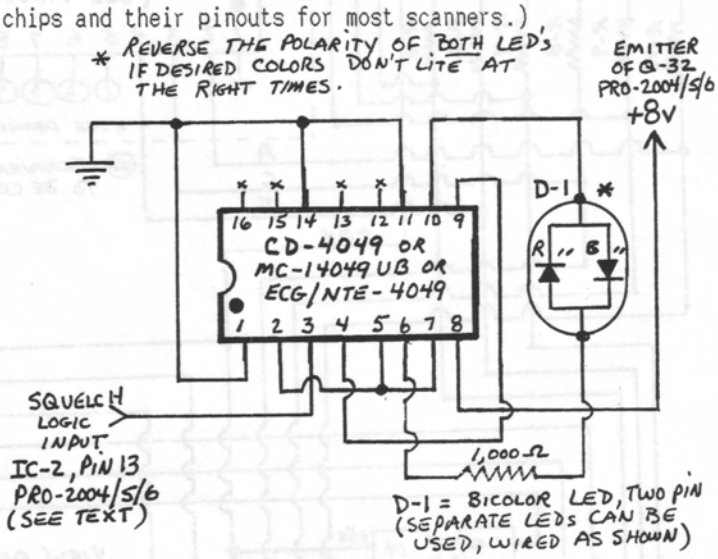
Announcing Doyle Communications Fall/Winter 1991 catalog of scanner and shortwave frequency directories, ham radio books, electronics how-to books; scanner antennas, 800MHz converters, amplifiers, and adapters. The latest catalog lists almost 100 books including Scanner and Ham Radio/CB Modification handbooks, Uniden freq directories, Federal and Military frequency directories, TV, VCR, & CD player repair books plus many more. Satisfaction guaranteed; if not satisfied, undamaged items can be returned within 10 days for a full refund, less S & H. Personal checks up to $50.00; VISA, MC and COD orders (USA only) ok. $1 catalog, refundable with order. ***Doyle Communications, Route 8; Box 18, Lake Pleasant, NY 12108.*** *Please mention this magazine when ordering your catalog. Orders, call (518) 548-5515 10am - 8:30 pm ET; closed WED & SUN.*

COMMERCIAL ADVERTISEMENT

If you don't have the time or capability to install mods in your scanner, we can do them for you in a timely, cost effective, professional manner. SPECIAL thru 9/30/91: We will install the new MOD-16A 25,600-Channel Extended Memory with Keyboard Memory Block Controller in your PRO-2004/5/6 at the regular price for the 6,400 channel MOD-16 ($275 + $12 S&H). Effective 10/1/91 this price will be $325 +S&H. Also on SPECIAL thru 9/30/91: the 12,800-Ch MOD-19A for your PRO-34 at the regular price for the 3,200-Ch MOD-19 ($225 + $8 S&H). Effective 10/1/91, the price will be $265 + S&H. COMMTRONICS ENGINEERING; PO Box 262478; San Diego, CA 92196-2478.

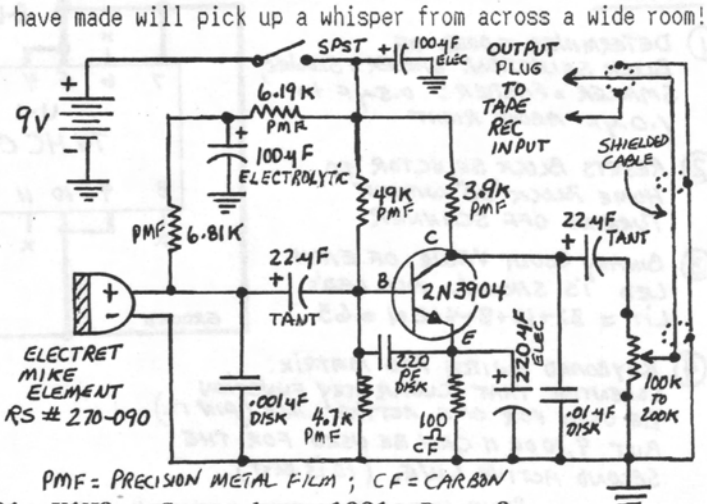
A NEW CARRIER-ON INDICATOR

Bob Scott of Virginia contributes a novel approach to a Carrier On Indicator. Refer to my MOD-32, page 182-187 for the standard approach. Bob's method appears to be more effective and simpler than mine. Other than using a chip instead of a transistor, the novel difference is a bi-color LED which glows GREEN when no signal comes in and RED when the SQUELCH breaks. The shortcoming of this method is the lack of a reliable source of bicolor LEDs, but maybe you readers know of a place. Connect the INPUT of the CD-4049 chip to Pin 13 of IC-2 in the PRO-2004/5/6 or to the SQUELCH OUTPUT PIN of the NFM chip in most any other scanner. (See V1N4 for a guide to the various NFM chips and their pinouts for most scanners.)



TURN ANY TAPE RECORDER
INTO A SUPER SNOOP LISTENING DEVICE!

This preamp will enable most any tape recorder to detect the sneeze of a housefly at 50-ft; maybe further if no other sounds are present to mask it! There are many ways to house this simple microphone and one-transistor preamp and I'll leave precisely how to your imagination. Private investigators might want to miniaturize while tinkerers can fit it into a shoe box. The housing is your choice; but build the circuit as shown using precision metal film resistors and tantalum capacitors for extremely low noise and leakage. The trimmer potentiometer is to control the Gain of the preamp for optimum recordings. The models I have made will pick up a whisper from across a wide room!



FROM THE READERS.....

Alan Parlato, NY, tells of an interesting phenomena in his PRO-2006, which I verified also in the PRO-2004/5!

PRO-2004/5/6 DELAY & PRIORITY INTERACTION

When the PRIORITY feature is off, the normal two-second DELAY functions on all channels where it is set. There seems to be about a half-second DELAY otherwise.

When the PRIORITY feature is on, there is an interaction that seems to shorten or eliminate the DELAY on all channels where the DELAY is set. At first I thought it might have something to do with the squelch setting, but then I noticed it only happens when the PRIORITY is on. When the PRIORITY is off, and in SEARCH mode, the DELAY works fine (regardless of squelch setting). When the radio is on an active channel and the PRIORITY channel is sampled, the squelch closes for a split-second (no signal). Now, if there is still a signal on the original channel, everything is fine, but, if the signal is gone, or if the DELAY timer was counting down when the sample occurred, the unit instantly starts to SCAN after the PRIORITY sample. The reason I think is because the DELAY timer was reset due to the PRIORITY sample. Of course, when the radio returns to the original channel, there is no signal to restart the DELAY timer, so the SCAN begins. The result is, if the PRIORITY sample occurs one-half second into the DELAY countdown, the rest of the DELAY is "cancelled". I'd appreciate your thoughts! /AP

EDITOR'S REPLY: *This oddity is not documented by Tandy so the best we can do is guess at it, but yours appears to be an "educated guesstimate". Obviously, it's a CPU function so there's little we can do about it. My EXTENDED DELAY (MOD-29) minimizes its effects, however. Many thanks for your well described finding that has not been reported elsewhere of which I am aware! /BC*

TIPS, HINTS, KINKS & MISCELLANY

INDOOR ANTENNAS: One of our readers, and I forgot WHO, (sorry), passes along a tip for an indoor antenna that's superior to the telescoping whip or rubber duckie that comes with the scanner. "What's His Name" says he gets good results from the amplified Color Supreme V Indoor TV antenna from Radio Shack, #15-830. Sounds like an alternative for apartment dwellers and others whose landlords won't permit exterior antennas! If this works, then there might be even better alternatives for some situations. Radio Shack's Compact Amplified Antenna, #15-1611, if mounted vertically, might be a hot dawg. Also to consider for cramped quarters: #15-1607.

POOR SENSITIVITY IN THE PRO-2004/5/6? I have seen this complaint a few times in various reviews around the rag mill. But I wonder. After learning the PRO-2004/5/6 inside & out I really haven't found sensitivity problemsin any that weren't the fault of a failed component. But something under operator control can ruin sensitivity AND restore it. I am almost embarrassed to say this because I am guilty of it, too, but check the position of the ATTENUATOR switch on the rear panel of your PRO-2004 /5/6 periodically! For the most part, it should reside in the "0 dB" position. Sometimes, there might be a need to set it to the "-10 dB" position and when you do you're likely to forget all about it and wonder a week later why you can't hear weaker signals like you used to. I have trained myself to routinely reach over the back of the set and make sure the ATT switch is flipped to the RIGHT (0-dB). Quite often, I find it to the LEFT (-10 dB) because I do a lot of WFM monitoring where the ATT switch is often required. Read on.....

NO AGC IN THE WFM MODE FOR THE PRO-2004/5/6: Sure enough, the PRO-2004/5/6 is one of the few series of scanners to provide Automatic Gain Control to its Front

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OTHER LITERATURE AVAILABLE

SCANNER MOD HNDBK, Vol-1: $17.95 + $3.00 S&H * _____
SCANNER MOD HNDBK, Vol-2: $17.95 + $3.00 S&H * _____
*(Canada $4 S&H; Other Foreign $5 S&H; add extra for Air Mail)
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Enclose a #10 S.A.S.E. and one loose extra stamp if you want hobby info & personal reply! Business inquiries exempt.

End Preamplifier and IF stages. AGC remedies myriads of problems including front end overload; desensitization, and intermod. For reasons not clear, the AGC function is active ONLY in the AM and NFM modes; and not in WFM! You can see evidence of this by tuning the FM Broadcast Band, 88-108 MHz, where to get the stronger stations to break SQUELCH, the ATT switch must be set to "-10 dB". This overcomes "desense" effects. At other times, the FM signal might break the SQUELCH but sound very distorted and garbled until the ATT switch is flipped to "-10 dB". This is "front end overload". No wonder, since FM BC stations routinely transmit 100,000 watts ERP and more! The strongest NFM public service stations are typically 300 watts or less.

PROVIDING MORE ROOM IN THE PRO-2004/5/6 & OTHER SCANNERS?

If you're willing to power your PRO-2004/5/6 or certain other base scanners from an external source of DC instead of AC, there is a super way to get more "real estate" in which to install modifications and goodies! First, let's look at alternate power sources. Most scanners have a special jack on the rear for 12 VDC power. If so, then Radio Shack has a good selection of AC-DC Adaptors which will do nicely: 273-1652; 273-1653; 22-127 and 22-120. Whatever you select, make sure the AC adaptor or power supply is rated for at least 10 volts DC and not more than 16 volts DC. The current rating should be at least 500-ma (0.5-amp). A major benefit of running your scanner with external DC will be a 90% reduction of heat within the scanner by the power transformer. (See V1N5 for a full article on this!) Now you guessed it! ***Remove the power transformer*** for a nice gain of "real estate". While you're at it, remove the A/C power cord; use it for something else. The power cord hole can be used for a jack or a cable bundle. Except for the bulk of an AC-DC Adaptor, there are no ill effects or drawbacks of running your scanner on external DC power. Advantages are MUCH LESS HEAT; less weight and LOTS MORE ROOM for modifications and things!

PRO-2004 PROBLEMS? Reports have surfaced on weak audio or peculiar Logic/Display problems in the PRO-2004. I've worked on some and helped others diagnose and cure these problems. Seems that a run of PRO-2004's were not properly soldered in the production lines. Trouble began right after sale. The factory warranty helped many where problems surfaced right away. In other cases, solder joints held up for a time before failing. Even today, several years after the PRO-2004 production lines closed, failures due to defective solder joints still crop up. One mode of failure is in the audio section where the sound fades in and out. A probable remedy is to resolder the plated-thru solder spot that's immediately behind CN-3, the internal speaker connector on the main receiver board. Apply heat & flow solder into this spot. Voila!

Some defects are in the digital section where the Display blanks out; memory is lost or the CPU locks up without apparent cause. This cure is more difficult, but fairly certain. Lift the Logic/CPU Board (PC-3) from the chassis and flip it over. Anywhere from one to 500 solder joints must be resoldered. First, resolder only those that look bad. This may or may not get the bad one. If not, mark the surface of the board in 1-inch squares and resolder all joints in one square. Test the unit. Proceed to the next square if not remedied by the first; etc, etc.

Only some PRO-2004's are susceptible to solder joint problems, (not all), and you might be able to tell about yours. Remove the cover and look around on the main receiver board, noting the greenish-white capacitors scattered about. If bare leads of these capacitors are exposed, look out! Note if any are cockeyed and not squarely installed. Also observe the vicinity of where the metal boxes & shields are soldered to the main board. Look for the presence of solder resin, a brownish, dirty residue. Properly soldered units will not show this gunk. If you note either situation, there's a chance that your unit can develop problems someday, if not already. Mostly patience is needed for the cure! 73/bc

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