

# The WORLD SCANNER REPORT

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## MY, HOW TIME DOES FLY

When you're having fun.....and drags when you're not!

October already! And the cold winter storms are about to sweep down upon the unwary and unexpected! With possible exception of Florida, most of this country's (and Canada's) weather will soon turn about-face to make it not a lot of fun to perform antenna and other outdoor maintenance. You might as well grab your tool kit, steel wool, various kinds of tape and other materials and get those antennas ready for the long, cold winter. Gunky and corroded aluminum should be polished bright and smooth with medium steel wool. Iron & steel hardware should be wire-brushed clean of excessive bird droppings, rust and layers of summer residue. Replace aged or deteriorated coaxial cable. Tape it securely in place so that the wind doesn't blow it about. Raise the antenna another ten feet or so, if you can handle it. (There is no single greater determinant of radio station performance than height of the antenna above ground!) Tape all connectors to seal them from rain, snow and condensation. Tighten nuts & bolts; secure guy wires and give every exterior part of your station a good once-over visual inspection along with any needed corrective and preventative maintenance. I'll never forget one cold winter's day in the Colorado High Country when an element of my Moonraker 6 Directional Beam antenna blew off during a blizzard. Die-hard radioist that I am, my sons and I went out; cranked down the tower and reinstalled that element, all the while the temperature hovered around 0-F. Ask us how much fun that was!

## RENEWAL TIME APPROACHING

Thanks to those who have already renewed for 1993. Others may wish to look at the EXPIRES DATE on the mailing label and if it says *Nov-1992*, this would be a good time to renew before you get caught up in the expense and rush of the coming holidays. Subscriptions are easily forgotten and then easily procrastinated. If you profit from and enjoy the "WSR", you should plan for your renewal before it's too late. If your subscription is about to expire, we'll remind you next month in the last issue of 1992. As a reminder, we now accept *MasterCard* and *Visa*, if more convenient for you.

## WARNING: RADIO SHACK'S DIODE PACKS MAY CONTAIN WRONG TYPES!

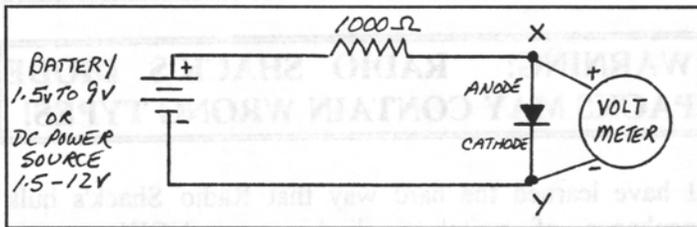
I have learned the hard way that Radio Shack's bulk packages of switching diodes may NOW contain undesirable types in addition to the specified 1N914/1N4148 types! I encountered a large number of flaky diodes that do not perform properly as isolation diodes! BEWARE! I built and installed an HB-232 project tonight and fretted and stewed for hours, knowing damned good and well that I made no errors, but about half or 2/3 of the project functions wouldn't work! Finally in desperation, I began signal path tracing thru some diodes, and used a diode continuity test function on my multimeter, and lo! And behold! I saw where 3 of 8 diodes had the correct voltage drop of .58-.65 volts but five were as low as .35 volts! This is not typical of silicon switching diodes, and when replaced with the correct diodes, my project worked perfectly.

I rechecked those funky diodes and they were good, but definitely NOT the 1N914/1N4148 desired type. In fact, the funky diodes had a part number on them as follows: **SD 150 -1**. Good diodes out of the Radio Shack pack had various numbers that didn't mean anything to me, so there's no sense to repeat them here, but the above part number definitely has a forward voltage drop of 0.35-volts which is not good for most uses.

If you purchased bulk packs of switching diodes from Radio Shack, catalog # 276-1122 or 276-1620, you're either going to have to test them before use or at least cull any with the part number **SD 150 -1**. It is best to test them before use. Testing with a multimeter diode test function, the reading should equal or exceed 0.55-volts and be less than 0.68 volts. But what if your multimeter doesn't have a diode test function? It's still easy to test silicon diodes. Here's how:

Connect a 1000-ohm resistor to the anode (unbanded end) of the suspect diode. Connect the (-) lead of a 1.5-volt battery (or power supply of 1.5 to 5 volts) to the cathode end of the diode (banded end), and connect the (+) lead of the battery to the free end of the 1000-ohm resistor. Now connect the (-) lead of a voltmeter to the

connection of the cathode of the diode and the (-) lead of the battery (Point Y below). Connect the (+) lead of the voltmeter to the anode of the diode (Point X below) and read the corresponding voltage drop across the diode. It should read between 0.55 and 0.68 volts. Discard the diode if the reading is more or less than that just specified! Here's a drawing of the test setup:



Sooooo, if your electronic project is not perfect in all respects, you might just test for flaky diodes and replace any with the proper types! This is especially pertinent to the HB-232 Scanner/Computer Interface where eight diodes are used for a very critical purpose. If you're having trouble with your HB-232, check those diodes!

#### HB-232 INTERFACE UPDATE

It's official: the Charley Test of the HB-232 Scanner/Computer Interface is over. Effective Oct 1, the price of the Kit is \$169.95 + \$5 S&H. However, the readers of another magazine were given until October 14 to take advantage of the special Charley Test price. We can do no less for readers of the "WSR". Accordingly, if you will mention your subscription number along with payment in full, the old price of \$129.95 + \$5 S&H is yours through October 14, 1992 after which the new price shall be firm and fixed.

The Charley Test of the HB-232 brought to light a lot of interesting perspectives by average hobbyists that weren't available to us in the Beta Test. Many changes to the software were recommended and we uncovered a few little bugs here and there. It is expected that the Release Version 1.0 of the HB-232 Program will be available on or about October 15, 1992. Charley Testers will be welcome to download the Release version from the *Hertzian Intercept BBS* at no cost, or to receive a disk of choice by mail for \$5 S&H.

One interesting change in the software utilizes the little known EEPROM on the HB-232's microprocessor chip and which eliminates the need to RESTART the scanner upon bootup. Other expected changes or enhancements will include a user color-menu, bug fixes, and better program documentation.

#### NEW BBS JOINS THE HB-232 NETWORK

The HB-232\_C Tech Support Conference & the RADIO\_TEK general radio technical conference are now being carried by *The HighSierra On-Line BBS* at Lake Tahoe, CA, (916) 577-4438 with capability to 9600-baud, 24-hrs a day. *HighSierra On-Line* joins the existing network consisting of the *Feedhorn BBS*, *TriState Data Exchange* and the *Hertzian Intercept* to make it easier to get technical support and the latest scoop on the HB-232. Welcome to SysOp Frank Gaude of the HighSierra On-Line, another BBS to tickle the gourmet palates of you modem freaks!

## FROM THE READERS

**From Alan Parlato, NY:** Voila! A.I.E. successfully adapted my TCF-4 to run with a speeded up 16 MHz PRO-2006. Got both back last Friday (8/28) and have used heavily over the weekend. Unit works same as a regular TCF-4 with a 12 MHz PRO-2006.

At my request, A.I.E. also changed the "default" to carrier squelch where before it defaulted to mute. Also the squelch triggering was adjusted to allow for quicker opening with lower levels of signal. For your info, the "FIFO" which they initially tried did not work. They finally programmed an entire new chip for the PRO-2006/16. Tony really went out of his way on this one. Too bad more companies don't give service like this!

The cost for the rework was \$500, but Tony offered to split with me in the hope that other 2006/16 owners will purchase a TCF-4 with the new chip. One of his customers saw my 2006 while it was there and I think you will be hearing from him for some mods.

In the end, I agree with your assessment 100%. It turned out to be very pricey for me! But in a major metro area like NYC, the difference in scanning is like night and day with so many out of state co-channel users tying up the scanner. I'm very pleased. There's only a few minor "peculiarities", nothing major---a "learned" type of thing, as you say. It also works fine with your MOD-44 Data/Tone Squelch!

It was a pleasure dealing with Tony. I'm sure the future will bring new and exciting units from A.I.E. Regards/Alan Parlato

**EDITOR'S REPLY:** *I am pleased for you, Alan. You're right that not many companies will work so intently to please one person. Of course, this can't be done unless there is reasonable hope for a larger return sometime in the future. A company that loses money or fails to profit is a company that doesn't last long. I think in your case, A.I.E. performed a valued personal service and chalked some of the cost up to Research & Development, which any healthy, growing company must do. Either not enough R&D or too much of it has caused many a company to go down the tubes. I'll betcha A.I.E. learned something from that ordeal and learning is worth something, no matter what. No doubt, the Hobby will prosper in part, thanks to you and to A.I.E.* 73/Bill

**From Richard Allen, NJ:** I decided to renew my subscription to the WSR for 1993 on the hope that the WSR will return to the format that the 1991 issues covered. As with other subscribers that you have quoted in the 1992 WSR, I believe too much has been devoted this year to computers. There is nothing wrong with a balanced publication but I subscribed for articles and information on scanners. I enjoyed the 1991 articles and have both of your mod books, but if I want information on computers, I'll buy a computer book, not a book or pub on scanners. By the way, I have and use a PC at home and at work. I also use mainframe computers at work where I maintain computerized accounting systems, so I am interested in computers. But the 1992 WSR has been overkill about computerized monitoring rather than balanced issues. Please consider a return to more info on scanners, product reviews, problem solving, mods, etc. Thank you, Richard Allen

**From Mike Flenz, WI:** Your articles on computer-related items for scanning are starting to push me closer to finally "taking the plunge" and buying a computer. Keep up the articles and advice on what to look for in a computer to make it useful in radio-related applications. However, please keep room in WSR for the basic scanner hacking mods and how-to articles, and late-breaking news on new scanners and "no punches held" reviews. Mike Flenz

**From Paul Hagood, NM:** Doc: Enclosed is my renewal for the WSR which is enough in itself to show my satisfaction. I was glad to see "The Computer Corner": as I'm not a computer owner now, but plan on buying one soon to go with the PRO-2006 I ordered yesterday from Marymac (800) 231-3680. (Bruce was on vacation, I spoke to Joe, \$299 delivered, GREAT) All the computer info I can get will help, and I'll be using your info as my criterion for computer purchase.....73/ Paul Hagood

**EDITOR'S REPLY TO RICHARD, MIKE & PAUL:** Richard, I notice in our data base that you do not report owning a PRO-2004, 2005 or 2006. I do see that the scanners you reported are not capable of being interfaced to a computer. While you may be very computer-literate, perhaps even more so than I, it is clear that you have no application for mixing scanners and computers. Therefore, your position is understandable.

Mike & Paul, you each own a PRO-2006 in addition to other scanners. I'm sure it's no coincidence that you lean toward mixing computing with scanning. Your positions, too, are understandable, even if the HB-232 Interface is not among your interests.

To ALL: There are several reasons why scanning and computing will be forever entwined and why the "WSR" will be required to support the topic. First and foremost, perhaps is underscored by the 1275 MHz of scanner spectrum which simply cannot be managed by the human mind. A simple computer and a half-assed Database Manager program will keep track of your scanner frequencies far better than your memory and a bunch of penciled or typewritten notes can handle. If your interests include only a few frequencies out of a small slice of the spectrum, then perhaps your memory and notes will do. But you are the minority. Most scannists are interested in a number of subjects and radio emissions in the spectrum between 25 MHz and 1300 MHz. Add to this, the preponderance of scanners with 200-400 channels and up not to mention the ease of memory expansions to as many as 25,600 channels, and it becomes abundantly clear that only a computer can serve the hobbyist's best long term interests. It's like this: an engine mechanic may very well be absorbed by the magic and wonder of the modern internal combustion engine, but that mechanic has to be something of an appreciator of fine tools, as well. The modern scannist who wants to hear all there is to hear and to be on top of as much as possible has no choice BUT to integrate a little computing with his/her scanning.

The "WSR" will respect and honor that genuine need, but I emphasize again that we will not become a computer magazine. You are right, Richard, there are enough computer 'zines out and about which do a better job than we ever could. We will, however, continue to explore the limits of scanning and let our Readers decide individually how high and how far they want to go. This means that computing and scanning are here to stay as a pair

but.....we will also continue to explore the arts and sciences of the scanners, as stand-alone instruments. I don't seriously propose that we can develop a mod a month, though. Gee, I don't have the resources to do that. Imagine the "WSR" becoming the "Mod-A-Month Club"! Hardly! But we are going to continue to explore and exploit scanners for all they're worth, and throw computing in as a major ingredient. Frankly, I don't know how to do any different, but this means that there is going to be a little something for everyone as much as we can make it possible.

**From Jose Villafane, CT:** Dear Doctor Rigormortis: I have an S-Meter on my 2005/6 and have conducted various tests with \$400 worth of antennas. After all these frustrating tests, I found two antennas to work best. One is the Scantenna from Grove Enterprises which is excellent on all frequencies from 25 MHz to 1300 MHz. I can bring in stations 45 miles away without problem.

The second antenna is a 7-element, 12 dB, Yagi Beam Antenna which is only for 800MHz and up. I didn't believe the salesman at Transel Technologies when I talked to him, that I could receive a signal that many miles away. The antenna is 41 feet above ground and has been monitoring 800 MHz, 42 miles away for about a month now, with best reception after 8 pm, EDT. The best tool of all is the S-meter. Without that, I would have never known which antenna really works best.

Back to the TCF-4; I have researched this and found that you cannot use the TCF-4 on PRO-2004/5/6 receivers without changing the chip inside to match each scanner; told this by the technician at A.I.E. Corp. I have a TCF-4 on my modified and sped up 2006, and have had no problem whatsoever with its performance. Everything is stated clearly on the instructions, step by step, and when I ran into a small problem with installation, I called the company and the technician guided me step by step with the procedure over the phone; so I can't understand why Alan Parlato from NY had problems with the RJ-45 jack when the instructions give the measurements as to where it can be installed.

The hardest part was an error in the instruction sheet. It said D45 but the correct one was D46 muting line, otherwise everything else was a piece of cake. I figured this was important information to share with other readers.

I heard that you were a genius in CB radio a few years back. I'm starting to get into it a little bit and would like to know if you have any issues of the *Eleven Meter Times & Journal* left? Also, please send any additional info you may have on CBs & performance.

I have a Cobra 21, 23 channel, peaked out to 10 watts. I also have a peaked out Realistic 40 channel, with a power mike, but like everyone else. I want to make it better. On my mobile, I'm using a K40 antenna and on my home base, an Antron-99 antenna, but I still want to make my performance better. When I start getting into trouble, that's when I know I've hit the limit with experimenting and that's the best part. Jose Villafane, CT

**EDITOR'S REPLY:** I've heard pretty good things about the Scantenna, but I don't know too much about it. If I bought every little gadget and gizmo to hit the radio market, I'd be in the poor

house so fast all your back issues of the WSR would disappear before your eyes. My guess is, at the price, its a winner. I don't know and haven't heard ANYTHING about that Transel Yagi antenna. Please provide me with the mfg's address & phone!

Regarding Mr. Parlato's TCF-4 and the RJ-45 jack: I had installed it for him, but apparently it was defective from the factory. I had no way to test it at the time as he did not provide the TCF-4. I had done some other work for him and installed the TCF-4 jack incidental to the other work. I have worked with only one TCF-4 and that only briefly. A.I.E. was supposed to send me one for evaluation, but I've heard nothing from them so far.

Careful of that CB stuff, Jose! The FCC is getting badder and badder all the time. In just a few short years, I have seen the maximum fines raised from a limit of \$500 to \$2000 and now it's something like \$15,000 per offense. Yes, I was a "master" of the Citizens Band during its heyday of 1972-1987. I got in on the ground floor in 1959 when the band was created and bailed out after FCC trouble came in '87-'88. I don't mess with the stuff anymore. Actually, the FCC first paid me a social call way back in 1981 or so. I won that little encounter, but they stayed zeroed in on me ever since, I suppose. Anyway, you ain't interested in all that ancient history. Radio performance is what's hot.

And peaking up those little radios ain't hot, but not for legal reasons. Aw, for sure, you want that modulation to be as close to 100% as possible and the AM carrier to be right on 4-watts, but man, there ain't a CB rig out there that can handle 10-watts with any quality! Besides that, it ain't the carrier power that gives a transmitter its performance; rather it's the TALK POWER or Peak Envelope Power. Far better to have a carrier of 4-watts or less and "forward modulate" to 12-watts than to have a 10-watt carrier and "downward modulate" to 4-watts. Yuk! Also, if you run a linear amplifier, it's far better to underdrive it for a lower than maximum carrier and let the modulation drive it to peak levels. Your signal punch ain't ever going to exceed peak anyway, so it's better AND cleaner to underdrive the carrier and maximize the modulation. There is no intelligence on the carrier; ONLY in the modulation. ONLY when you're sending CW is carrier power all that important.

But what is important, in addition to TALK POWER, is the same hot stuff as what's important to SCANNER performance: the antenna. I've said it before and I'll say it again: if I had \$1000 to spend on a radio station, I'd have a \$10 radio and a \$990 antenna system. There are THREE goshawful important factors to consider in your antenna system: (1) loss between radio & antenna, the lower the better, (2) GAIN (dB) of the antenna, the higher, the better, and (3) height of the antenna above ground level and nearby obstacles; the higher the better. This says it all in a nutshell, although books could be written to elaborate on the finer points. There are minor considerations for specific application antennas, like for scanners where bandwidth is very important. It's not terribly important for CB unless you're also a Freebander and happen to operate between 25.5 MHz - 27.995 MHz. Few antennas perform very well over THAT range without a little work.

I edited/published the "ELEVEN METER TIMES & JOURNAL" between May, 1983 and April, 1988, when the FCC intervened to

shut it down for good. We still maintain yearly sets of the back issues, an Index for which is available for \$3.00, ppd. I'm not sure that much more can be said about how to get the most out of a CB station than in the EMTJ, which probably has something to do with why the FCC wanted it shut down. The EMTJ remains relatively current in technique and principle, but is certainly outdated where products and data are concerned, so I don't know how much value it can represent for you. Maybe you should try a yearly set before committing to all five years' worth. I have been away from the CB and Freeband scenes for so long now that I am not an expert anymore. Lots of products, radios and antennas have come and gone in the last four years. I can safely say that the best radios on the market today are still the Cobra 2000 GTL base and the Cobra 148 GTL mobile. These units have been in continuous production since 1978 and remain the best there is. There are some pretty hot EXPORT radios out and around, but these are of a different class and are grossly illegal, not to mention lacking in performance in the receiver department. If the Freeband piques your interest, both the Cobras can be illegally tricked out to operate between 25.5 MHz and 27.995 MHz. You still wind up with a hot little receiver, which to my way of thinking, is half the idea of communications in the first place. Transmitting is only the other half; no more and no less important than receiving. What's said is worthless if no one can hear or understand it. Hope this is helpful to you. 73/Bill

## REALISTIC PRO-2026

Radio Shack has introduced another fairly decent scanner, the PRO-2026, basically a clone of the Uniden BC-760/950XLT and the Regency R-1600. In fact, the 2026 is very much identical to the Uniden/Regency versions with two exceptions: the 2026 has the 108-118 MHz radionavigation band, and cellular capability is MUCH easier to restore. Because of the close similarities between the PRO-2026 and the Uniden/Regency versions, we'll dispense with any further discussion and get down to the cellular mod as paraphrased from the September issue of "Monitoring Times":

The 2026 has cellular frequencies deleted at the factory, but restoration is the easiest yet. Clip one marked wire! You need only a Phillips screwdriver and wire cutters.

1. Remove the four side screws from the bottom cover. Pull the cover loose and set it aside.
2. Facing the front of the 2026 and with the bottom side exposed, locate the small circuit board in the lower right-hand corner and find jumper L201. Cut L201 and separate the cut ends.
3. Reassemble the radio which now has continuous 806-956 MHz coverage and 30 KHz search increments in the cellular band.

**EDITOR'S NOTE:** 30 KHz Step Increments!? That's what was said in "Monitoring Times". The BC-760/950XLT will SEARCH the cellular bands ONLY in 12.5 KHz increments, so perhaps this is another favorable difference among these clones. For all intents and purposes, the PRO-2026 is clearly the better radio and at a lower price, too! I don't know about its hackability, but the 2026 should have all the potential of the Uniden/Regency clones.



## THE COMPUTER CORNER

*The REAL BASICS OF DATABASES & DATA PROCESSING!*

Relax! We won't talk much about computers THIS MONTH. Instead, let's take another look at databases and information management: two important subjects, whether or not you have a computer. All the better, if you do, but those who don't know a computer from a pretzel will also benefit. Everyone collects and processes data and information. So what are the meanings of and differences between *information* and *data*? *Information* is *knowledge* obtained from research, study or instruction. *Data* is *factual information*, as in measurements or statistics, and is a basis for reasoning, discussion or calculation. Differences are minor, but books embody information more so than data while charts, lists, tables and directories mostly contain data.

Ok, now let's talk about scanner FREQUENCY record-keeping. Your shack probably contains lists or books of frequencies, one of which is POLICE CALL like Radio Shack peddles. They are all organized about the same way, typically: CITY, USER, MISC, FREQ, MISC, CALLSIGN. Now, let's build an example with four categories of data, the first in Channel Number order, ascending:

### BY CHANNEL NUMBER

CHAN	FREQUENCY	USER	LOCATION
Ch-1	162.550 MHz	NOAA-Weather	Los Angeles
Ch-2	158.970 MHz	Police - North Area	San Diego
Ch-3	121.500 MHz	Aeronautical Emergency	Worldwide
Ch-4	026.915 MHz	CB/Bootleggers	National

No problem to memorize and keep track of THIS data, but multiplied a hundred or a thousand times, then either you won't have a useful record system or else you'll burn the midnight oil to create a system. We'll make a good system with three more tables like the above, but each organized differently. Here's what I mean:

### BY FREQUENCY

CHAN	FREQUENCY	USER	LOCATION
Ch-4	026.915 MHz	HF CB/Bootleggers	National
Ch-3	121.500 MHz	Aeronautical Emergency	Worldwide
Ch-2	158.970 MHz	Police - North Area	San Diego
Ch-1	162.550 MHz	NOAA-Weather	Los Angeles

### BY USER

CHAN	FREQUENCY	USER	LOCATION
Ch-3	121.500 MHz	Aeronautical Emergency	Worldwide
Ch-4	026.915 MHz	HF CB/Bootleggers	National
Ch-1	162.550 MHz	NOAA-Weather	Los Angeles
Ch-2	158.970 MHz	Police - North Area	San Diego

### BY LOCATION

CHAN	FREQUENCY	USER	LOCATION
Ch-1	162.550 MHz	NOAA-Weather	Los Angeles
Ch-4	026.915 MHz	HF CB/Bootleggers	National
Ch-2	158.970 MHz	Police - North Area	San Diego
Ch-3	121.500 MHz	Aeronautical Emergency	Worldwide

Look at all the trouble you'd have to go to just to keep tabs on and have quick access to the data contained in just four records. The more fields per record, the more ways that data has to be organized to make it useful. The preceding boxes can each be considered a file; each line, a record and each column, a field. Suppose you wanted to add a column or field for CALL SIGN and another for the type of RADIO SERVICE? Fine and dandy, but you'll have to make up two more boxes, one organized in call-sign order and the other in order of radio service.

If you don't get down to the nitty gritty of organizing your data, and if you have any at all, it won't be accessible and you won't take advantage of it. Here, let me prove something to you: take any and all frequency directories that you might have! Oh, you use them, all right, but you sure as heck don't wear the pages out flipping 'em back and forth as the scanner races along, hitting one frequency after another! Directories are useful for making up lists of the frequencies to be programmed into your scanner, but they're not great for quickly looking up things as needed when you're actively engaged in scanning. Lists or maybe index cards organized along the lines of what's shown in the boxes on the preceding page are among the few alternatives available to you for reasonably quick and useful access to your data. No matter what, it takes a lot of work to set up a data retrieval system, and then if your system is on paper, it takes a hell of a lot of work to use and maintain it. Now, let me trip your trigger.

Suppose you lived in an area, as I do, where something over 10,000 frequencies are known to be in use? Imagine setting up five to ten columns of data, ten-thousand lines deep! You'd never do it with pen & paper or typewriter, that's for sure. But there is a way to do it, almost painlessly, depending on if you want to spend a few bucks and if you have a computer. There, I said that nasty word again. Sorry. But if you take your scanning seriously, and most of you claim you do, then you are missing out on a MAJOR facet of the Hobby if you don't have an efficient data retrieval system. Knowledge of what you're doing can be a cubic inch or a cubic mile, and either degree can be fun, but believe me, you're missing out on the best of the best without an information handling system to support your efforts.

Ok, so you have taken a lot of time and trouble to organize and compile your scanner frequency records onto some neat, clean sheets of paper or a stack of index cards. You have just invented a "database". The distinguishing characteristic of a paper database is that YOU work for it more than it works for you. If you are a serious scannist, you'll just grit your teeth, roll up your sleeves, and commit yourself to the drudgery of maintaining paper records. After all, it's necessary. Unless you have a computer and a database manager, of course!

Computer databases were recently introduced here in the "WSR" by Perry Joseph over a five-part series of articles. Mr. Joseph covered the "paper trail" all the way through computer databases. I let a couple of issues go by without further mention to soak the subject into you more astute readers. Now we have to continue the discussion to greater depths because data retrieval systems are going to be a VITAL sideline to scanning in the coming years. Here's why: there are at least fourteen scanners on the USA market that have 100 or more -programmable channels. That

number will jump this Fall or Winter when Uniden announces a new product line. As a matter of fact, there is really no technical or cost reason NOT to produce a scanner with 100-channels or more nowadays. Memory chip prices have really dropped in recent times. I think the era is coming when 50-100 channels will be considered "entry-level" and "journeyman" levels will be 400-1000 channels. Over a year ago, I demonstrated the ease of slam-dunking 25,600-channels into the PRO-2004/5/6, so the main limitation now facing us is not the technology or cost of memory as it once was; rather the big obstruction now is HOW to program and maintain very large channel memories. While there are at least three scanners on the market with 1,000 or more channels, the manufacturers know good and well that darned few hobbyists are going to program *that many* by hand. It is no coincidence that two of these mega-memory scanners also are equipped with RS-232 interfaces for computer control & autoprogramming.

Still, even with a computer, that many channels are not going to be effectively utilized without the aid of a *database* to go along with the computer. Therefore, I view database management and expertise of use to be a vital class-prerequisite before the market can be expected to venture forth with much more in the way of high technology digital scanners. If the manufacturers perceive the hobby to be ready for them, there will be no reason to not make the offering. Whether they do or not isn't the prime focus here simply because I have shown the scanner community HOW to multiply memory by 2 to 63 in as many as ten different scanners. We can do it ourselves, but without the proper tools to work with, it hardly seems worth the while. In fact, the 400-channel PRO-2004/5/6 are a little *too much to manage by hand*; or don't you agree?

There are two ways to acquire the kind of data that is best suited for both your scanning hobby and a computer database manager. The first way that you will want to master, but not utilize any more than necessary is copying frequency data from published books, guides, lists and your own old handwritten or typed data. It took me the better part of two years, on and off, to make a computerized file of 5,000 frequencies for the San Diego area! You really don't want to do MUCH of this sort of thing, believe me! But you will always have to do some.

The BEST way to acquire data for your computer is directly from another computer file! And there are several sources, the most common of which is frequency data from computer BBS's, friends' computer files and commercial frequency data sold on disk by companies and individuals. For example, you can buy the entire FCC database for something like \$10,000, which averages to about \$200 per state. Obviously, this is OUT for all but the most affluent companies and individuals. To the other extreme, more and more BBS's around the country have a sideline in scanning and encourage hobbyists to post their frequency lists on the board which become available for downloading by other patrons. A middle-of-the-road approach and possibly the best of them all has become available over the last couple of years!

Grove Enterprises (publishers of "*Monitoring Times Magazine*") has been making available to hobbyists the FCC Database on a per-state basis! The Grove Database comes with a limited use database manager, sometimes called "FoxPro". Grove didn't look very far ahead with the present incarnation of the FCC Database and you

can't do a hell of a lot with it, as it comes out of the package, though it greatly exceeds **POLICE CALL** and other directories. Depending on your state, the Grove Database can be MASSIVE. For example, the California FCC Database contains 250,000 records and requires about 38-Mb of hard drive space for installation, after which about 15-Mb is required to operate the database. The smallest Grove Database state is Vermont at 6,500 records, requiring about 2-Mb of hard drive space for installation but then only 380-kb for operation. Once The Grove Database has been installed, the excess megabytes are not needed. An average of all states in the Grove Database comes to 42,000 records with 8-Mb required for installation and 2.5 Mb to operate. Your state will differ, of course, but this average is typical for the states of Louisiana and Iowa. Much LESS than average are Rhode Island, Delaware and District of Columbia, while Texas, Florida and Pennsylvania are much GREATER than average.

I said that the Grove Database and its FoxPro manager are of limited use. That depends, I guess. If you are a beginner hobbyist or a computer neophyte, the Grove Database for your state will amaze and astound you, for at the touch of a key, you can quickly find frequency information for most any city, company or non-federal agency within your state. THAT might seem like the end of the world and WHAT ELSE could we possibly want to do with a database? True, it is awesome and for a time, you maybe won't want to do anything else with it. In any event, the Grove Database is about the only game in town for an exhaustive computer-based frequency record for your state. And the price is within reason.

For advanced scannists and those computists who know their way around a database manager, the Grove Database leaves something to be desired. For example, every entry in the FREQUENCY field begins either with a "K" or an "M" to signify KiloHertz or Megahertz.. This can be unwieldy when using the data in your own database manager and/or to do something useful like AUTOPROGRAM your scanner through an Interface! I had to strip all these prefix letters off and move the decimal three places to the left for those with a "K" to get the frequency data into a usable format for automated programming. Another liability of the Grove Database is that there are no regional or county fields. *This is a problem* because most monitoring shacks can cover the majority of a county and perhaps an adjacent one, but you're not interested in frequency records upstate. So, for maximal use, you have to use the SORT and QUERY functions to select specific CITIES of interest within the area of coverage. Here in San Diego County, there are no less than 40-50 cities and towns that I had to manually cull from the Grove Database. Such an important database should also have a COUNTY field or at least fields for LATITUDE and LONGITUDE to permit the scannist to select records from ONLY within a desired area or region.

Not to worry: at least two efforts are underway to develop user tools to overcome some of the deficiencies of the Grove Database. One of them is in Beta Test and can be downloaded from the *Hertzian Intercept BBS* from File Area #3 under the title, FIXDELGD.ZIP. DataFile, Inc., which brought PROSCAN and SHERLOCK to you is working on another promising tool called XPORTFCC, but we can't say much more at the moment other than it will grab data from the Grove Database and make it compatible for Auto-Programming the HB-232 Scanner/Computer Interface!

The bottom line is that any reasonably serious scannist needs a computer and a database manager program to ease the drudgery of data acquisition and processing. The Grove FCC Database is a significant market entry for this purpose. Despite its shortcomings, the Grove Database comes with my highest recommendations as a major tool for the journeyman to master scannist. Call Grove Enterprises at (800) 438-8155 for info about your state.

Now, back to the basics for a wrap up. A *database* is an organized accumulation of data. A *database manager* is a computer program that organizes and accumulates data. The Grove FCC Database comes with the database for your state AND a database manager program to handle it. I think you can order JUST the database at a reduced cost if you already have a dBASE (.DBF) compatible database manager program. There are all kinds, types and styles of database manager programs on the market, from the **commercial** Cadillacs of dBase IV and Paradox to **shareware** types such as PROFILE and FILE EXPRESS to **freeware**, although I don't know of any in the last category. Simply put, YOU need a computer and a database manager, and that's all there is to it. We will deal with the inner workings of database managers and how to use them in the coming months, and whether you're a raw neophyte or a grizzled expert, I rather suspect we'll have something to offer most everyone on this continuing and increasingly important subject.

If you want to get a head start on preparing YOUR frequency data for use in a database manager program, then you should, without asking too many questions, start laying out your data in a logical, orderly manner, allowing for not only what you think you need NOW, but also for what you will need LATER when you become experienced and knowledgeable in the art and science of database management. Right now, you may be using a very elementary form of record keeping or data arrangement like that shown on page 6 of this issue. You need to allow for growth and for unknowns in the future. It is strongly recommend that you arrange your database as follows: (The NAME of the field is in *<brackets>* followed by number of characters or spaces needed in the field.)

FIELDS & CHARACTER REQUIREMENTS OF A SCANNER FREQUENCY DATABASE			
Field 1: <Misc>	1	Field 11: <Duration>	6
Field 2: <Channel>	3	Field 12: <Type Code>	4
Field 3: <Frequency>	9	Field 13: <Class Code>	4
Field 4: < Mode>	3	Field 14: <Regional Location>	3
Field 5: <Delay>	1	Field 15: <Comments/Notes>	20
Field 6: <LockOut>	1	Field 16: <Service Code>	2
Field 7: <Op Mode>	4	Field 17: <Call Sign>	8
Field 8: <Step>	4	Field 18: <City>	12
Field 9: <Date>	6	Field 19: <Misc A>	11
Field 10: <Time>	6	Field 20: <Misc B>	11

Please hold questions for now but in brief, the AutoProgrammer of the *HB-232 Scanner/Computer Interface* requires the first six fields and ignores the rest. The HB-232's AutoLogger logs to the first 11 fields. Fields 12-20 are required of most any database just for the sake of the information value and to offer markers on which to quickly look up given records. For example, if you heard someone give a call sign, you could go right to your database and have it "look" for that exact one, or one close to it. Just because the

first 11 fields are used by the HB-232 doesn't mean that YOU can't use them, too, even if you never own an HB-232 or other controller. Think about it: every one of these Fields with possible exception of Fields 8 and 11 are really very generic and useful.

We're about to confront a major issue: a need for *standard* formats and layouts of scanner frequency databases! It is often very tedious and time consuming to convert data in one layout to that of another. In fact, there are people who make a very good living doing just that! I'm not going to fight to the death over the matter, but my proposed Scanner Frequency Database format and layout is proposed as a starting standard for the scanner hobby. So far, I have seen not less than a dozen scanner frequency databases concocted for various and sundry purposes and while each has merits over the rest, none combine it all, and none are really complimentary to or compatible with the rest. We need standards to foster order and sense out of chaos and disarray. Imagine some people driving on the right side of the road and others on the left. The scanning hobby might fare best to promote a standard layout and format for frequency files to facilitate the sharing and use of data! It is a lot easier to manipulate and arrange database info than I have let on here, but lack of a standard format serves only to keep the average hobbyist from advancing. The state of the art of existing technology coupled with the power of the computer, even a cheap one, now offers the hobbyist more latent power than ever, but it will remain dormant until we come up to speed on databases.

Coming articles in this corner will focus on database management and how to make the most out of what you have to work with. If you will begin to organize your scanner frequency data along the lines as proposed herein, or even CLOSE to it, you'll gain a head start with some momentum for the coming New Age of Scanning!

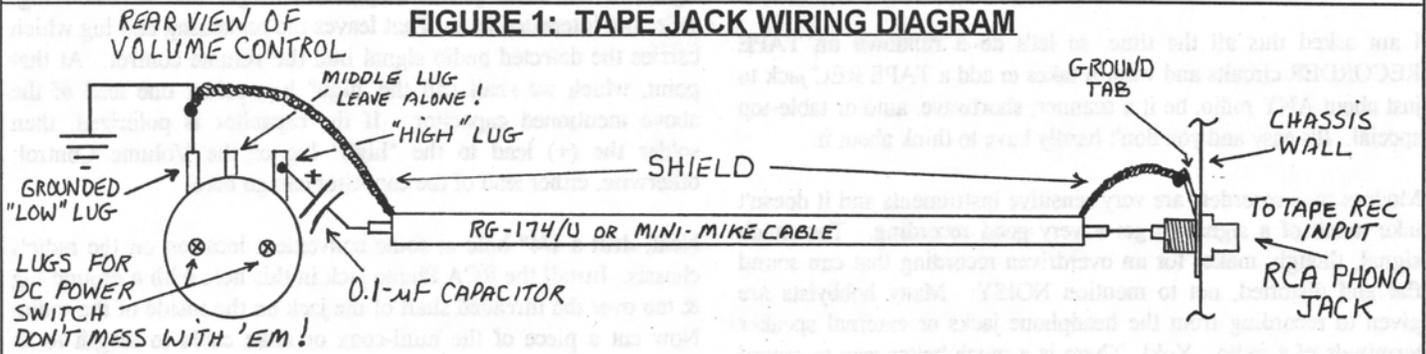
#### NEW LEDS NOW AVAILABLE!

Take a quick look at Radio Shack's 10-segment bargraph LED, #276-081, page 124 of the new 1993 catalog. Nice, but no cigar. Now, imagine something similar, but which comes as interlocking 1, 2, 3, 4 or even 5 LEDs in one bargraph block and which are made so that you can combine any number of segments AND colors to meet your own special needs! I received a sample that consisted of a 5-segment green block; a three segment yellow block and a 2-segment red block. After I slid them together, the size and looks were similar to the RadioShack bargraph above, except in the stated colors for a much more attractive block especially suited for S-Meters, Center Tune Meters, etc. For more info about these neat LEDs, contact: **LEDTRONICS, 4009 Pacific Coast Hwy; Torrance, CA 90505. (310) 549-9995 or Fax (310) 549-4820.**

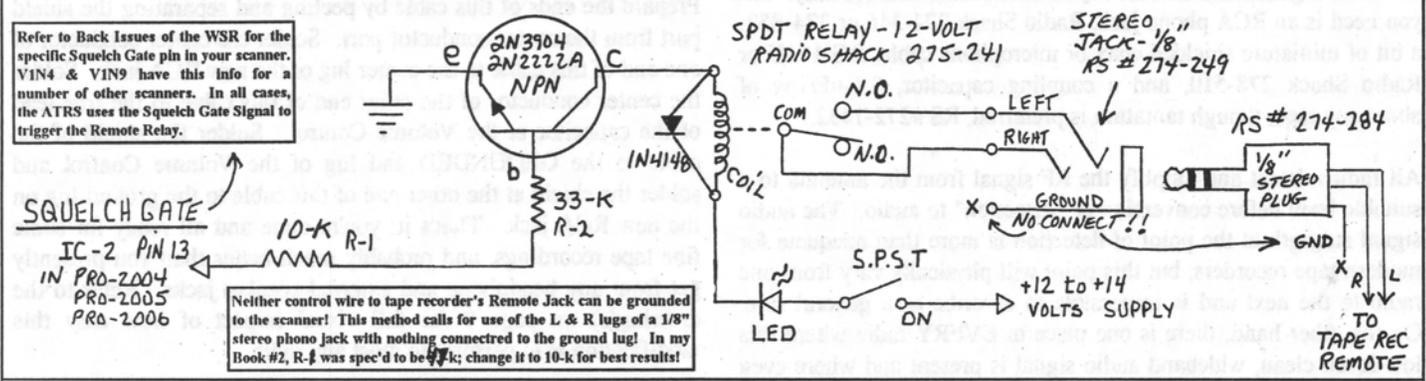
**ANOTHER NEW LED COMES!** Well, they have been out for a while at about ten bucks a pop, but BLUE LEDs are now becoming better known and available. The price has dropped to the extreme upper limit of reason at \$2.80 ea at **DigiKey (800) 344-4539**. Blue LEDs are now available in both T-1.75 and T-1 sizes. The forward voltage drop of a blue LED is higher than typical LEDs at 3.0 to 3.4 volts, and they can't withstand a *reverse voltage* any greater than 5.0 volts, so you have to be careful or lose your money in a wisp of smoke. Current drain runs about 30-ma. The wavelength is 470-nm and the intensity is about 4-13 mcd, depending.

# TAPE RECORDER JACKS & AUTOMATIC TAPE RECORDER SWITCHES

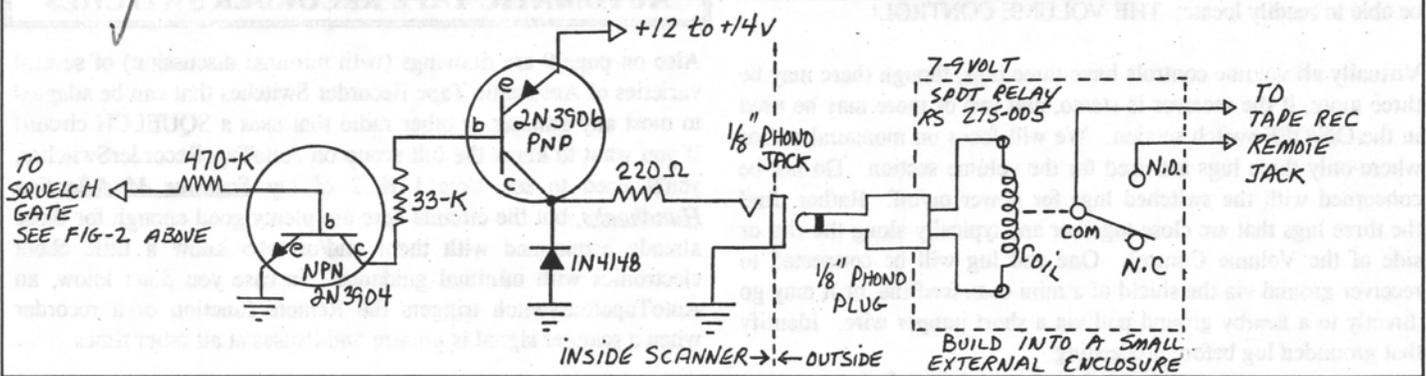
**FIGURE 1: TAPE JACK WIRING DIAGRAM**



**FIGURE 2: THE OLD AUTOMATIC TAPE RECORDER SWITCH & A FRESH IDEA (MOD-33)**



**FIGURE 3: A NEW AUTOMATIC TAPE RECORDER SWITCH**



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## ADDING A TAPE JACK TO ANY RADIO!

I am asked this all the time, so let's do a rundown on TAPE RECORDER circuits and what it takes to add a TAPE REC jack to just about ANY radio, be it a scanner, shortwave, auto or table-top special. It's easy and you don't hardly have to think about it.

Modern tape recorders are very sensitive instruments and it doesn't take much of a signal to get a very good recording. Too much signal, though, makes for an overdriven recording that can sound flat and distorted, not to mention NOISY. Many hobbyists are given to recording from the headphone jacks or external speaker terminals of a radio. Yuk! There is a much better way to record the audio signals from almost any kind of a radio and it's easy. All you need is an RCA phono jack, Radio Shack 274-346 or 274-852; a bit of miniature shielded coax or microphone cable, RG-174U or Radio Shack 278-510, and a coupling capacitor, 0.1-uF/16v of about any type, though tantalum is preferred, RS #272-1432.

All radios detect and amplify the RF signal from the antenna to a suitable level before conversion or "detection" to audio. The audio signal strength at the point of detection is more than adequate for modern tape recorders, but this point will physically vary from one radio to the next and is impossible to describe as a general rule. On the other hand, there is one place in EVERY radio where this low-level, clean, wideband audio signal is present and where even if you're blind in one eye and can't see out of the other, you'll still be able to readily locate: THE VOLUME CONTROL!

Virtually all volume controls have three lugs, though there may be three more, if the receiver is stereo, and two or more may be used in the ON/OFF switch section. We will focus on monaural radios where only three lugs are used for the volume section. Do not be concerned with the switched lugs for power on/off. Rather, find the three lugs that are close together and typically along the rim or side of the Volume Control. One end lug will be connected to receiver ground via the shield of a mini coax feedline, or it may go directly to a nearby ground pad via a short jumper wire. Identify that grounded lug before proceeding.

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## FIRST CLASS MAIL

- + Antenna Maintenance Before Winter Sets In: Hurry!
- + **Renewal Time is Approaching;** Check Mail Label
- + **WARNING:** Radio Shack's Diode Packs May Contain Wrong Types!
- + IIB-232 Scanner/Computer Interface Update; New BBS Joins the HB-232 Network
- + Reader Update: A.I.E's TCF-4; Readers on computers; Reader tests some antennas
- + Realistic PRO-2026; Cellular Restoration & More!
- + Realistic PRO-43; Restore Cellular & 54-88 MHz; Circuit discussion & Block Diagram
- + The Computer Corner: Basics of Databases & Data processing; Grove FCC Database
- + New LEDs Available for Hackers!; Also BLUE LED's now reasonably priced!
- + Add a Tape Recorder Jack to Most Any Radio; more Automatic Tape Recorder Switches!

Next there is a MIDDLE lug which feeds the volume-controlled signal to the audio power amplifier. Forget the MIDDLE lug; we're not interested in it. That leaves the remaining end lug which carries the detected audio signal into the volume control. At that point, which we shall call the "high" lug, solder one lead of the above mentioned capacitor. If the capacitor is polarized, then solder the (+) lead to the "high" lug of the Volume Control; otherwise, either lead of the capacitor can go here.

Next, drill a 1/4" hole at some convenient location on the radio's chassis. Install the RCA Phono jack in this hole with a ground lug & tab over the threaded shaft of the jack on the inside of the radio. Now cut a piece of the mini-coax or mike cable to length to fit neatly between the Volume Control and the new RCA jack. Prepare the ends of this cable by peeling and separating the shield part from the center conductor part. Solder the center conductor of one end of this cable to the center lug of the new RCA jack. Solder the center conductor of the other end of this cable to the free lead of the capacitor at the Volume Control. Solder the shield of the cable to the GROUNDED end lug of the Volume Control and solder the shield at the other end of this cable to the ground lug on the new RCA jack. That's it; you're done and all ready for some fine tape recordings, and probably much better than you presently get from any headphone and external speaker jacks. Refer to the drawing(s) on page 9 for full visual impact of how easy this modification is to perform to most any radio.

## AUTOMATIC TAPE RECORDER SWITCHES

Also on page 9 are drawings (with minimal discussion) of several varieties of Automatic Tape Recorder Switches that can be adapted to most any scanner or other radio that uses a SQUELCH circuit! If you want to know the full scoop on AutoTapeRecorderSwitches, you'll need to see Vols 1 & 2 of my Scanner Modification Handbooks, but the circuits here are plenty good enough for those already acquainted with them and/or who know a little about electronics with minimal guidance. In case you don't know, an AutoTapeRecSwitch triggers the Remote function of a recorder when a scanner signal is present and Pauses at all other times.