DMS-NEWS

The "Dreaded Mod Sheet" Newsletter!

DE
K6AYB

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DMS-NEWS FIRST EDITION MAY 1993

"THE SULTAN OF SANTEE"

Hey, it's May!

This might be a good time to buy your scanner a present, take it to a concert, a parade or just to Mc Donald"s

We're an ancient 5 months old now, and the newsletter is looking a little better each month, largely thanks to Jaime J, who keeps adding things to this overstuffed computer of mine, and extending whatever ability I have to use it. (oh, the pain!) Actually Jaime dislikes scanners so that makes his help even more special. In this issue you'll find a couple of mods I found for the new PRO-46, including the elusive (for me anyway) CMT-800 mod. The others are for delete beep, and a hyper speed-up. I'd like to know what is happening with the CMT changes, but so far, rumors. If any body has facts, please share them. As always, remember this is your newsletter, and it loves to eat data. There's never enough....

The DMS-NEWS at this point has only a little more than 100 members, and can only grow and get better with many more. I have a fantasy you can fill. (Not that kind!) If each current member could generate only one member more, that would double our size, our data base, and allow me to do many other things with and for our publication. This issue, I'm adding a coupon to make it easier to "spread the word... I hope you like the new comparison list, it will help in choosing a scanner, and let you know what's out there and what can be done with it. (For a few of the scanners listed, the answer is obvious.) JP

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HAM FREQUENCIES

For what's happening around, and on-the-spot road conditions, along with personal glimpses, there's a lot to be heard on the ham bands. Within your area, at least one repeater, usually in the 2 meter band, will re-broadcast the space shuttle. Some repeaters, due to height and power can be heard consistently for very long distances. I hear one from 110 miles away! (all MHz)

10 meter	29.000	to	29.700
6 meter	50.000	to	54.000
2 meter	144.000	to	148.000
1 1/4 meter	220.000	to	225.000

A search run in any of these bands should result in many frequencies, especially during drive time, and late evening.

There's lots more activity to be found in the KHz band.

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Watch 31/32 MHz for skip!

PRO-46 MODS

Here they are! Many of you have asked for these mods, and finally they are collected here. I have personally checked these.
Of course doing them can void your warranty, so as always, plan to undo your work, just in case.

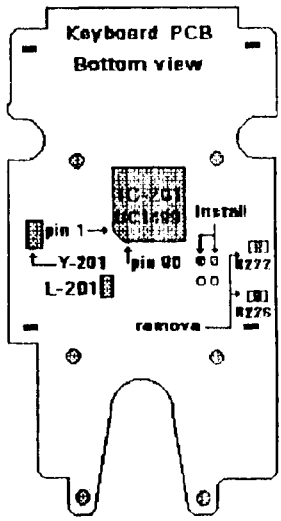
Take off the antenna, and pull the four case screws. The case opens from the bottom up. Lift away the the upper board, (take care with the connector at the lower right corner.) Remove the RF shield, unsolder with as little heat as possible. (it's copper-clad plastic) Note the position for re-assembly.

CMT Mod As in the drawing , carefully remove R-222 and R-226. They are jumper chips, marked "0", and you need at least one to relocate on the upper empty pad, to the left as shown. The other chip can be located on the lower pad, to restore 66 to 88 MHz, NOTE: Since these are jumpers, they can, if needed, be replaced with wire .

DELETE BEEP. Simple! Locate the trace between pin 80 on the ICU and L-201, and clip it at a convenient place between. I use surgical scalpels for trace cutting, but whatever you use, it needs to be VERY sharp.

HYPER-SPEED-UP. Locate the Ceramic Resonator (Y-201) and replace it with a 14-16 MHz crystal. If this value is too high, the keyboard will lock up. The resonator has three leads, but the center lead is to ground. The crystal leads (2) go to the outside pads, and some fitting will be required. Note: crystals are sensitive to shock, so be gentle when cutting the leads. That satisfying snap is a no-no here.

All the mods are on the drawing below but you'll find them separated in the DMS update sheets.



ACE DOWNCONVERTER

Ace Communications has a downconverter (DC-89) that converts 806-900 MHz to 406-500 MHz It is 3 x 2 x 1 1/2 inches is size and can be used hand-held or base. It uses a new surface mount pre-scaler / synthesizer referenced by a quartz crystal clock to assure frequency accuracy. It has an internal battery and BNC connectors
The suggested retail price is $89.00
For additional information contact ACE COMMUNICATIONS MONITOR DIVISION, 10707 EAST 106th STREET, FISHERS, IN-46038 Tel 317-842-7115

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SHARE THE HOBBY!

NICAD"FIXER"

Don't toss that nicad battery in the trash until you try this circuit. A nickel-cadmium rechargeable battery can often appear deceased, when in fact it's internally shorted by web-like shorts that occur internally in cells you haven't used for a while. these shorts will gradually discharge the cell and prevent it from being recharged. These "whiskers" can be blown away with a high current applied for a few seconds, allowing the cell to be recharged normally. This circuit can be built to accommodate any size cells as long as all the cells are the same size. You need two fully charged nicad cells to give sufficiently high current to get the effect. Size AA batteries can deliver a continuous current of 0.5 amps, plenty to do the job.

When you close S-1 , a shot of current goes through the "bewhiskered" cell and causes the tiny shorts to open, and as a fringe benefit, if the cell has become reverse polarized, the polarity is corrected. You can build this circuit for just a couple of bucks (You knew I was going to say that!) especially if you have an "S" meter laying around. Use the appropriate sized battery holders for your needs, and if you set things up in a configuration with the good cells in one holder it's easy to keep track of what's good and what isn't.

S-2 and the light bulb aren't really required, except to let you see the state of things, and the meter,being part of the circuit, eliminates the need for an "external " meter

To determine the value of R-1, place a 50K pot in the circuit and adjust it until the meter gives full deflection, and then measure the value of the pot, and use a fixed resistor of that value in the circuit.

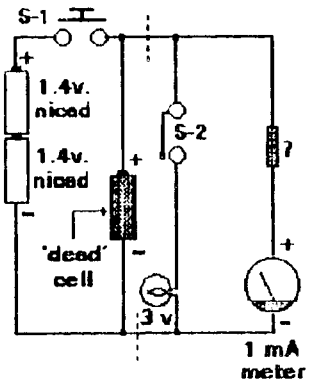
(Another old guy's trick!)

How to use it...

With two fully charged nicads in the main cell holder the meter will read"0" until S-1 is closed . (When you close it you should see 2.8 v.)

Put the "dead" cell in the fixer holder. There should be no reading. If there is reverse polarity, the meter will show negative. If the cell shows a positive reading you should be able to charge it normally. If it shows completely dead, Press S-1 for a few seconds (count three) and watch the meter rise. If there's no reading the battery is too far gone to save. If you don't get 1.4 v. or close, try S-1 again to see if it brings up the voltage. If you are successful , a couple of regular full discharge/recharge cycles should restore the battery to as good as new.

Note S-1 is momentary contact, the flashlight bulb is 3v. and is a load for the meter S-2 is to monitor the operation and should be a toggle or slide switch. The bulb may or may not glow . Some will, some won't. The circuit right of the dotted lines if just to monitor the action and is not necessary except for that purpose.



SCANNER TIP

If you are planning to use a hand-held scanner in a car, and you have a cassette player, you should get the adapter (available at RS for $19.95-RS 12-1951) made for playing a CD player through your car stereo. It plugs into the headphone jack on the scanner. Hand-helds just don't have the audio punch for a car environment and running it through the car stereo makes it much more listenable.

Roy Clautier

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SPREAD SPECTRUM

Now there is a new newsletter "SPREAD SPECTRUM SCENE" covering PCW/PCS, digital cellular phone, CDMA/TDMA , networking, packet and experimental amateur spread spectrum communication that is worth checking into. You can find out about the new ham radio data from the FCC for spread spectrum communicat- ions. SSS covers new products, how to articles, basic tech info and what's happening in industry, commercial regulatory and the amateur circle. Send a business size SASE for a free sample to Randy Roberts, PO Box 2199, El Granada, CA 94018-2199. The June issue was 24 pages packed with lots of information. Subscription rate is $29.95 for 12 issues. Tell SSS that you heard about them through THE BASE CLUB. (Through curtesy of the Bay Area Scanner Enthusiasts Club)

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WYSIWYG: To keep the DMS-NEWS fresh and active, we need to expand! If this issue pleases you, spread the word wherever you can. A lot of material in this newsletter is familiar stuff to some, but please don't forget there are "Newbies" all the time!

VIP AIRPHONES

Most of the comm-traffic in the 225 to 400 MHz military air band is in AM, but it appears there are exceptions. Some VIP calls can be found in the WFM band as well . The plane assigned to the Secretary of State (SAM-89671) uses 397.05 MHz .Other VIP air-ground comms are on 336.80, 345.50, and 382.35... The SAM (Special . Air Mission) flights , such as Air Force One (Pres) AIR Force Two (Vice Pres) and other Gov't VIP comms can be heard on 4175.70 MHz downlink, and 407.05 uplink AM mode.

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OLD GUY"S TRICK

Several times I have had occasion to need to redirect audio from one point to another in a scanner (or other equipment,) to add a jack for convenience on the front of my venerable PRO-2020, as an example, and here's the way I make it switchable in the easiest way. (I'm not only cheap, I'm lazy!) Use an appropriate sized Double Pole - Double Throw switch. disconnect the audio leads from the speaker and solder the leads to the center posts of the DPDT. Run leads from one of the switch pairs back to the speaker, and the remaining pair goes to the new output. This gives you an either/or option that can often come in handy.

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MASS TO GO?

In Rapid City, South Dakota , the local McDonald's shares it's frequencies with the Cathedral of OUR LADY of Perpetual Help. Sometimes the service from the church comes into McD's so well that the "Mac'ers have to shut off the equipment and take orders from the cars. Usually though, McD's lets the sermon play through the system and customers say they like it. Save your soul and would you like fries with that?

"NICAD BATTERIES - FACTS AND FALLACIES " Published on Radio
Communication May 1988, TT.

J.Field, ZSJF,in "Nickel cadmium batteries for amateur radio equipment" (Radio ZS September 1987,pp4-5) provides a useful survey of the facts and foibles of nicads.The following extracts from his article attack some of the common myths and also provide some safety hints.

*1) "Rapid charging causes a decline in cell capacity".

NOT TRUE provided that the charge is always terminated at a safe point.

*2) "You should not charge only partially discharged cells as this causes a loss in capacity."

NOT TRUE. It is not necessary to discharge fully nicad batteries before charging. In fact, THE OPPOSITE is true. Repeated partial charging gives an increase in the number of charge/discharge cycles compared with full-discharged cells.

*3) "White crystals growing on the tops of nicad cells mean that the seal is faulty and the cell should be scrapped."

NOT TRUE. The electrolyte (potassium hydroxide) is extremely searching and can penetrate the seals used in minute quantities. These crystals are potassium carbonate, which is harmless and can be removed with soap and water. The action of the carbon dioxide in the atmosphere reacts with the electrolyte to form the crystals. After removing the crystals, it is recommended that a smear of silicon grease is applied to slow down the growth of new crystals. The amount of electrolyte lost in this way is insignificant.

*4) " I have a cell which appears to take a charge, but after the normal charging period the open circuit voltage is very low. I have been told I should throw it away."

NOT TRUE. The reason the cell won't take a charge is usually due to minute crystalline growth across the internal electrodes, caused by prolonged storage. A cure that nearly always works is to pass a very high current for very short time through the affected cell. This fuses the internal "whisker". Discharging a large electrolytic capacitor is one method of doing this. But note that in a battery the faulty cell MUST be isolated from the other cells since zapping the complete battery will not usually result in a cure. Charge the capacitor to about 30v and then discharge it through the faulty cell. Several attempts may be required to clear a stubborn cell.

*5) "A battery contains a cell with reversed polarity. The only cure is to replace it".

NOT TRUE. The reversed cell can usually be corrected by a similar technique as that given for 4). After re-polarizing the cell, the complete battery can be recharged in the normal way. Full capacity

can be regained after about five cycles.

*6) "A nicad battery should be stored only in a discharged state".

NOT TRUE. It can be stored in any state of charge. Due to its inherent self-discharging characteristics it will eventually become fully discharged after a sufficiently long period of storage. To recharge the battery before returning it to service, a "conditioning" charge of 20 hours at the normal charging rate is recommended. Afterwards charge normally; full capacity can again be expected after about five cycles.

*7) "It is not advisable to keep a nicad battery on permanent trickle charge as this causes permanent degradation of the cells".

NOT TRUE. So long as the trickle charge current is adjusted correctly, the charge can continue indefinitely without loss in cell capacity. The safe current can usually be obtained from the manufacturer's data, but 0.025C is a reasonable guide. (about 100mA for a 4Ah cell and PRO-RATA). This enables the battery to remain fully charged.

*** ZS5JF lists 7 safety points:**

*1) DO NOT short circuit a fully-charged battery. This if prolonged, can cause excessive gas production with the danger of possible rupturing of the sealed case.

*2) Nicads contain a caustic electrolyte: this is perfectly safe as long as common sense is used in use and handling of the cells.

*3) A nicad can supply a very high current for a short period (a 4Ah cell can supply over 500A for a few seconds). Sufficient thought should be given when selecting a fuse between the battery and the equipment. The connecting wire should be capable of passing enough current to ensure the fuse blows quickly in case of a short circuit.

*4) DO NOT use partially-discharged cells with fully-charged ones to assemble a battery. Assemble the battery with all the cells discharged and then charge them as a battery.

*5) DO NOT carry a fully- or partially-charged battery on an aircraft without taking proper safety precautions. A short-circuited battery pack can be a time bomb in such situations. Consult the relevant IATA regulations or ask at the airline check-in.

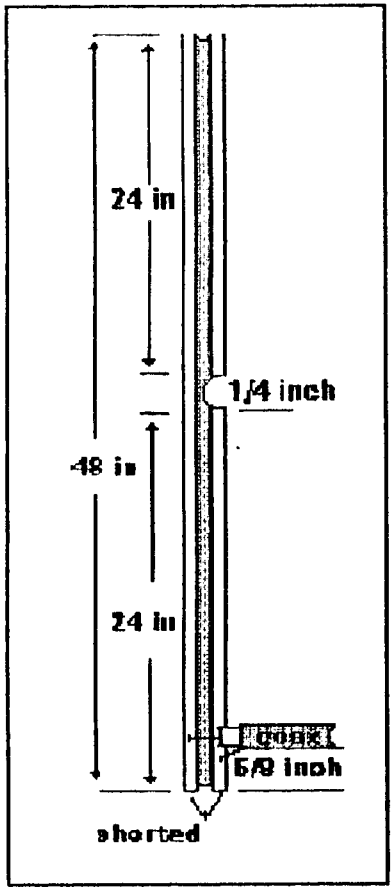
*6) DO NOT subject battery packs to very high or low temperatures. Never dispose of a battery pack in a fire or throw it out with domestic waste. If it cannot be disposed of properly it is probably best to bury it in the garden in a safe spot.

*7) DO NOT discharge battery packs below about 1V per cell, otherwise there is a possibility of cell reversal.

Via the HAM>link< BBS
612/HAM-0000 V.32
Saint Paul, MN

From Dave Mangin's Files

-POLE ANTENNA



If you can do it cheap, I like it! This antenna is that and it works well, especially where space is limited.

Construction is as simple as you can get, the hardest job is stripping the wires.

NOTE: Here's another Old Guy's tip... Notching wire is a big no-no. With RF it can cause signal loss, and with any wire a nick can be a disaster in a connection, causing a break . Rather than stripping wire the easy way (across or around) if you "whittle" the insulation, more parallel to the conductor, notches can be avoided.

.Pay special attention to the 5/8 inch dimension at the bottom end of the antenna , it works as a matching transformer . Also, at the connection points between coax and conductor, and braid and conductor, use one full turn of wire to make the connection, and trim off the excess.

Here's more math .To cut any antenna to specific lengths to zero in on specific frequencies, including velocity factors. The velocity factor in cable determines the electrical, as opposed to the physical length . The velocity of wave travel along an antenna is slower than in free space, which has the effect of making the antenna too long relative to frequency, and the antenna must be made shorter than the same frequency in free space. The velocity factor for bare (uninsulated) wire is 95% , while insulated wire, as in this antenna (300 ohm lead in) is 85%. A single insulated wire has a velocity factor of 90%

The formula is 300/F(MHz) so as an example : 300/455=0.6593..meter.

To convert meter to inches, X 39.37=, so 0.6593 X 39..37=25.9582. now comes the velocity factor. 25.9872 X 0.85= 22.064. Therefore, an adjusted antenna at full wave for 455 MHz needs to be 22.06 inches long. Drop the .06, unless you're very fussy!

Receiving antennas are very forgiving. Any of your final figures can be rounded to the nearest quarter inch without noticing any change. however, to get the most from your scanner, wherever you can, if space allows, use the highest multiple you have room for.

PRO-33 800 MOD!

Often, when a company manufactures a scanner, the microprocessor that's used is one that is going to be the next "new and greatest, and this appears to be one of those times. This mod is one I found by accident while digging around for other stuff, and if you still have one of these. here's a bonus: Remove the antenna and battery case the usual way (four screws) and gently open the case, working from the bottom up. Work your way down to the logic board just like in the PRO-34 (See the DMS)) Find and clip D-11 to add 800 MHz. I suspect, but don't know, that due to the age of this scanner, it will be continuous coverage. Re assemble. I don't think you need to worry about voiding your warranty! Please send me your results so as to keep data accurate JP

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I gotta have help!

Here I go begging again! To keep this newsletter fresh and up to date requires input, and that has to come from <u>you!</u> The format of the newsletter packs a lot of material in a small space, and being a monthly, we, you and I, are able to use a lot of stories and news the magazines can't... Be a part of this and part of sharing the hobby.

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PROPOSAL!

What makes this newsletter work is new members, both for material and financing. I've got an idea to help encourage you to get just one more member each. **Become a sponsor!** Here's how it works:

Show your DMS-NEWS to some one who is interested. I'm including a coupon with space for <u>your</u> name as well as the new subscriber. From this point on. each new subscriber's name will be coupled with yours in our data base. When the 200th subscriber rolls in, that sponsor will get a **TEN POUND BAR of GHIRADELLI's FINE CHOCOLATE**, and next years subscription, free! Do it just for fun.

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800 to 900MHz ANTENNA

If you have a real passion for monitoring the 800 up end of the spectrum here's an antenna that's designed to curl your toes! It's an eleven element loop yagi beam antenna designed for base station roof mounting. It comes fully assembled and is directional so its good if your target signals are all in one direction, or if you want to rotor mount it and "zoom in" on distant stations. The manufacturer has a splendid reputation for 800 up technology, and I've heard that this antenna really brings in the stations. It will probably get your neighbors thinking you are tuned to the "little green men"

Cost $75.00 (plus $4.00 shipping from: Cellular Security Group, 4 Gerring Road. Gloucester MA, 01930. Toll free, 1-800 - 487-7539...

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MENTION DMS-NEWS!

Whenever you order a product, write for a catalogue, or place an order, help all the "True Believers " by telling the vendor you heard about them in the DMS-NEWS. As we grow, this will help us all. Thanks , JP

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PRO-39's DIODES

D-4 enables 68 to 88 MHz, if present, but also deletes 30 to 54.MHz. D-6 enables cellular when removed, D-5 enables the 800 MHz band, and D-7 makes cell spacing 12.5 K (A No- No)

VACATION LAWS

Beautiful America offers us more freedom to travel than any other country in the world, but as you travel from state to state, You can find varying laws on most every thing, including scanners. The states named below have laws concerning scanners. I don't have specifics but it may be to your advantage to check 'em out.

Arkansas, California, Florida, Indiana, Nebraska, Oklahoma, South Dakota, and West Virginia

Try calling 1 800-448-5170 for information about a club called RADAR, if you do a lot of traveling.

CELLULAR LAWS

There is a lot of confusion about scanners with the new law (Docket 93-1) which went into effect April 26, 1993. Here are a few positive answers to help cut through the fog.

Scanners can still be legally modified by individuals.

The law covers transceivers as well as receivers., if the transceiver has a scanning memory.

As a scanner owner it is legal to own and sell modified scanners, and a cellular modifiable scanner can still be repaired by either a manufacturer or an individual.

Cellular capable scanners still in a dealer's inventory can be legally sold.

It is legal to share cellular restoring information.

Tunable receivers (non-scanning) with cellular coverage can still be manufactured and sold

HIGH FREQ ALLOCATIONS

Here's the breakdown of the frequencies between 800 and 1300 MHz.

806 to 890 is non-government land mobile.

Cellular telephone:

825.03 to 834.99 non-wireline mobiles
835.02 to 844.98 wire-line mobile
870.03 to 879.99 non wireline cell sites
880.02 to 889.98 wireline cell sites
890.00 to 902.00 non-government exclusive land mobile/government exclusive radiolocation
902.00 to 928 .00 non government exclusive radiolocation and amateur
928.00 to 935.00 non-government exclusive fixed and government radiolocation
935.00 to 941.00 non government exclusive land mobile and government exclusive radiolocation
941.00 to 942.00 nongovernment exclusive fixed and government exclusive radiolocation
942.00 to 947.00 nongovernment exclusive fixed broadcast
947.00 to 960.00 non government exclusive fixed broadcast
960.00 to 1215.00 aeronautical radio navigation
1215.00 to 1240 government exclusive radiolocation and space to earth navigation satellites
1240.00 to 1300 .00 government exclusive radiolocation and non- government exclusive amateur radio.

NO SECRET ANYMORE!

The Motorola VHF (DPL) in the limousine used by the head of the CIA, is on 166.528. This may be the last time I get to list a frequency! Does anyone have the frequencies used by the guards at Leavenworth? JP

RADAR

This column isn't about scanners except in an off-the-wall way, but it is information you might use. An organization named "Radio Association Defending Airwave Rights" (R.A.D.A.R.) has sent me a copy of their newsletter, and I thought with summer travel coming on, many of you might like to check it out. From the sample they sent me, I surmise that it's prime drive is to show the populace how to avoid getting caught by radar, and if caught, how to beat the ticket. There's lots of material on laws concerning seat-belts, radar detectors, auto insurance , speed traps and such. It's a one page foldover newsletter with large print, on glossy paper.

The issue they sent me uses the first page for some good travel tips. The primary reason for my mentioning the newsletter is a very nice included "travel chart" covering state-by-state mobile scanner and radar detector laws.

R.A.D.A.R. also has publications that they sell and or include in their annual membership.

The Safe Motorist's Guide to Speedtraps By John Tomerlin and Dru Whitledge, 367 pages of information on speed-traps, police frequencies, the enforcement arsenal used by police and more, state by state.

The Bare Facts About Bear Traps By Glenn Woodworth. Provides drivers with a detailed game plan to avoid being stopped, improving chances of getting off with a warning, and winning in court if you are ticketed. (? jp) This is the the inside story, told from a cop's point of view. Either book is $19.95, Basic subscription is $29.00 Annual. From R.A.D.A.R.4949 S. 25-A, Tipp City, OH 45371 (800) 448-5170.

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It seems simpler and cheaper to me just to drive lawfully! Be careful...Jer

AIRCRAFT WEATHER

This is a list of all (or nearly all) of the frequencies used nationally by aircraft to exchange weather info with ground stations. You won't be in range of more than a couple of them, but when you find yours, it's a good way to get the jump on weather developments. If you have an auto tagger, (thanks Les) just dump all of them in and see what you get! They are all AM. The first on the list is the "flight watch frequency" and is used every where.....

122.00, 124.625, 126.625, 127.625, 128.475, 132.725, 133.025, 133.675, 133.775, 133.925, 134.175, 134.525, 135.725, 134.825, 135.425, 135.475, 135.675, 135.700, 135.900, 135.925, 239.800, 342.500, 344.600, 357.200,

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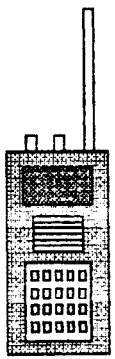
LOW POWER BUGS

Right at this moment I'm listening to an unidentified bug at 49.830 MHz. A look in my "file-pile" tells me that the band I'm in belongs to the hands-free 49 MHz sets, for which the FCC has assigned 49.82 to 49.90. This part of the spectrum is used a lot by private security patrols, private detectives, construction outfits, and sports enthusiasts.

MONITOR: dictionary... One who warns of faults or informs of duty; one who gives advice and instruction by way of reproof or caution...



SCAN: dictionary... To climb, to leap, to mount...
To examine with critical care; to scrutinize
To examine by counting the feet (verse)

FREQUENCY: dictionary... A crowd; throng, a concourse: an assemby

CELL: dictionary... Any small hollow space

FROM: New Twentieth Century Dictionary (unabridged) 1934