

UNIDEN INTRODUCES NEW SCANNER

capable of automatically downloading closest 100 channels and frequencies in users' zip code and tracking multiple trunked radio systems.

Uniden America Corporation introduced at the 1999 Consumer Electronics Show in Las Vegas, a new radio scanner that simplifies locating local channels and frequencies and tracking trunked radio systems.

The Smart Scanner feature, available in the new handheld model, BC245XLT, enables users to easily download the closest 100 channels and frequencies available in a users' zip code. The user simply connects the scanner to a modem with a special cable provided with the scanner. The scanner will then dial into a preprogrammed, toll-free number that identifies and automatically downloads the closest channels and frequencies.

"The Smart Scanner feature eliminates the hassle of finding local channels and frequencies in a directory and loading them one by one," said John Harris, Uniden America Corporation's Senior Vice President. Ken Ascher, Chairman & CEO of Communications Electronics said "It's a terrific convenience for scanner users."

"The TrunkTracker(tm) II feature makes the BC245XLT able to track both GE/Ericsson and Motorola trunked radio systems. Previously Uniden introduced the TrunkTracker(tm) radio scanner--the first scanner capable of tracking a conversation as it jumped frequencies across Motorola trunked radio systems. Now TrunkTracker II enables scanner users to track conversations on trunked radio systems made by both major system manufacturers.

"When a conversation changes frequencies on a Motorola or GE/Ericsson trunked radio system, TrunkTracker II automatically follows the conversation so users don't have to manually change frequencies to find the rest of the transmission," Ascher said. "Again, it's a revolutionary convenience for scanner users." "The BC245XLT handheld radio scanner with both SmartScanner and TrunkTracker II technology will

be available in July, 1999 for a suggested retail price of \$499.95. In addition, Uniden plans to introduce the SC200 handheld radio scanner also featuring Smart Scanner technology and an alphanumeric display in October, 1999. Ascher recommends to customers who want the earliest delivery of these new Bearcat scanners, to reserve their scanners now at the Communications Electronics (CEI) award winning secure web site at <http://www.usascan.com>. The CEI price for the BC245XLT is \$269.95 plus shipping/handling. This was the same price as the popular BC235XLT when it was introduced by CEI in 1997. CEI welcomes all major credit cards which are not billed until the order is processed. For over thirty years, Uniden Master Distributor CEI has been marketing Bearcat scanners and other Uniden wireless products to government agencies, dealers and consumers throughout North America.

MCCAIN SEEKS BILLS TO REWRITE TELECOM ACT

WASHINGTON -- Senator McCain plans to introduce a series of bills next year that would rewrite key portions of the controversial 1996 Telecommunications Act, a top aide said December 10. Lauren "Pete" Belvin, chief counsel on the Commerce Committee, told a conference of telecommunications lawyers that Mr McCain (R, Arizona) is concerned that the law hasn't helped consumers at all. And it is debatable, she said, how much benefit businesses have reaped from the measure, which deregulated the telecommunications industry.

A key question will be how the law is affecting deployment of networks capable of transmitting data over the Internet at high speed, she said. While businesses have enjoyed better networks, those improvements haven't filtered down to the residential market.

One major goal of the 1996 act was to bring competition to local telephone service, a goal Ms Belvin said hasn't been met. Since the act's passage, regional Bells have been consistently denied permission to enter coveted long-distance

markets because regulators say they haven't sufficiently opened their local networks to competition.

Ms Belvin said many of the premises of the 1996 act "are going to get in the way of deployment of advanced technology to residential users as badly or worse as they got in the way of competition in the local loop for voice telephony for residential users."

But James Cicconi, AT&T Corp's senior vice president for government affairs, said changing the law "would bring investment in the industry to a screeching halt." While the 1996 act isn't perfect, he said, it has brought "reasonable certainty" regarding government regulation to the industry. "The investment that is taking place ... is occurring because, after three years of court decisions, regulations, regulatory interpretations, fights, arguments, etcetera, we're finally developing a level of certainty," he said.

But Commerce Committee lawyer Ms Belvin said the senator's intention would be to "give competing providers of local services more opportunities to make good on their claims they want to get into local markets and provide services to everyone." Earlier in the conference, Commissioner Michael Powell of the US Federal Communications Commission said the panel should use restraint as it reviews mergers. Currently, the agency is reviewing major proposed mergers between AT&T and Tele-Communications Inc.; SBC Communications Corp. and Ameritech Corp; and Bell Atlantic Corp and GTE Corp.

The FCC judges mergers based on whether they are in the "public interest." But that standard is so vague that it needs "limiting principles" so that industry and financial markets can anticipate whether the FCC will intervene, Mr Powell said.

He said regulators should not try to substitute their judgment for that of the marketplace. "We lag behind market trends," he said. "Our visions are usually 20 years out of date."

Mr Powell's comments came following a Wall Street Journal story December 9 that said some FCC staffers and commissioners would contemplate denying the Bell Atlantic-GTE and SBC-Ameritech mergers outright. Mr Powell said it was too soon for him to make a judgment on the mergers.

-- Dow Jones Newswires

FREEMPORT POLICE UPDATE

Curtis, N2WWM passes along the info that Freeport LI, NY is now being heard on **460.2875**.

NJSP DATA MYSTERY SOLVED

If you listen to the NJ State Police's trunked system than you've probably heard the data bursts on group "400-12". During one of the recent nets I mentioned it and asked if anyone knew what it was. Moments after the net closed I received this e mail....

"The data bursts that you are hearing on the NJSP trunk are the telemetry units from the highways (i.e. weather info, etc.)

Joe, N2OAD".... Thanks Joe!

CONFESSIONS OF A FORMER CORDLESS PHONE MONITOREE

By Joe Tyburczy

"Must-See TV" was one, long yawn. I couldn't stomach another blockbuster movie. 187 channels of cable, yet there was nothing worth watching. So I did what any self-respecting radio nut did. I dragged out my scanner.

An all-band, all-mode scanner is a fascinating toy, especially in the Hollywood Hills. Oh sure, you can tune into the cops, the studios, the airport, and the fire brigade. But the most fascinating stuff I ever heard came from my neighbors on their cordless phones.

The gay blade two doors down calling a 900 line to hook up with hot dudes...the cute babe from across the street ordering lacy bras from Victorias Secret...some hotshot down the block arguing with his agent about the ignominy of directing second-unit shoots for a slasher picture. It was an endless pageant of kooky characters and wild situations.

And the range of this thing was astounding. In densely-packed Beechwood canyon, I could pick up cordless phone conversations for over a half mile in all directions. Of course, I augmented the antenna with every piece of metal I had on hand at the time.

I was rewarded by hearing this rather interesting exchange one night. It was close. Probably within 3 blocks:

WOMAN: I need some new pictures. Something really different than the last ones/
MAN: I could chain you up.

WOMAN: Like Bettie Page.

MAN: Exactly.

WOMAN: My place has those big exposed beams. That could be a really hot scene.

MAN: Hell, I'll come over there with my Makita and put eye bolts right into the beams if you like.

Another intercepted conversation from somewhere in the neighborhood involved two women. They say that lesbians never have sex because when you get two women together all they want to do is talk. It was true. Listening to these two made me drowsy.

1: Oh, Huggsie, I miss yoo.

2: Whyn'cha come over, Poopie Doopie?

1: Little Doopie is tired.

2: Ohhh. I can come over then.

1: Will you rub my feet, doopie?

2: Of course, Hugsie.

1: And we can cuddle?

2: Under the quilt. Like two bunnies.

1: (sigh) Like bunnies.

I monitored these gals for weeks, hoping to hear something more sexually explicit than this. But instead, their relationship seemed to evolve into a sibling kind of argumentative rivalry. They accused each other of being immature...of being emotionally unstable...or of borrowing clothes and not returning them.

More conventional couples were no better. Take the typical boy/girl love-spat call. This was a more-or-less standard listening feature of my neighborhood. Here's a sample:

GIRL: Don't call me "baby", I *know* what's been going on.

BOY: What, baby, what?

GIRL: Don't act so innocent. You think I'm stupid? Ashley told me.

BOY: What does Ashley know? I don't understand?

GIRL: She *saw* you at the club, mister. She said that tramp was practically giving you head at the table!

BOY: Oh come on. She's making stuff up. She's just jealous of you, you said that yourself.

GIRL: Ashely wouldn't lie to me! She's my best friend! Which is more than I can say for you, you bastard!

Yet the bulk of what I heard provided a more meaningful insight into human nature. Any day of

the week I could hear people calling a friend or relative to air some kind of complaint, such as....

VOICE: I just feel really discouraged you know. I missed my class for the last three weeks in a row. The other night I went to Marla's showcase and they were like all, you know, "we've got agents after tonight" and all. I just..I don't know...I just don't feel that things are coming together for me here.

Soon, I realized that my newfound diversion had graduated from casual listening to a devoted obsession. I would walk around in the neighborhood and notice people ---slick guys and gals, tattooed and sunglassesed ---and I'd wonder which of them I'd heard on the phone making a drug deal or pleading with their parents for one more loan. I would look forward to savoring the latest chapter of these real-life dramas with my morning coffee. The newspaper paled in comparison to the latest emotional disaster from the sea of humanity that surrounded me.

It was just too much. I had to force myself to stop. I removed the battery pack from the scanner and let it run down. I went, in effect, cold turkey. I can't say it wasn't rough. It took a lot of meditation, a set of wind chimes, and some over the counter pain-relievers, but a week later I was watching network TV like everybody else -- and actually liking it.

WB6NYC ASKS.....

I lined up all the walkie talkies I had and took a picture. Don't you think I need some more????



SCANNING RESOLUTIONS

By KC2AYC

This time of year is always a time of reflection. Some people reflect on where they have been and most of us try to envision where we would like to go in the next year.... be it in our relationships, our jobs, our physical being, sports we may participate in and even our hobbies.

Just like businesses have business plans, the real movers and shakers of the world usually have some kind of written plans of the goals they want to accomplish. Writing things down makes it easier to focus on the whole picture and yet you can tackle your task in small manageable steps.

At this time of year most of us set goals for the coming year.... be it financial goals, goals to stop smoking or lose weight...well, why not evaluate what it is you want to get out of the radio hobby. Then make a written plan of what you want to accomplish over the next year.

Your plan doesn't have to be elaborate either, it should be personalized and realistic. You may want to go hog wild and set up a new monitoring post with everything from HF to Sats with some trunk-tracking in between or it may be as simple as getting a new long wire strung or finally getting that elusive local public works frequency you can't find.

So grab a pen and paper and jot down your road map for 1999.

My goals are this: I want to finally find the frequency used by the Village of Cedarhurst DPW...not in Police Call or Scanner Master and I want to take stock of the radios I have, utilize them the best I can and sell the ones I don't need. There's nothing that gets under my skin more than 4 radios lying around half programmed.

WA2SQQ comments.....

Ironically, the above comments arrived as I was writing a few words on the same subjects. How many times do you find yourself frantically looking through Police Call or Scanner Master trying to find related frequencies for a local "happening" in progress? A plane has crashed, mutual aid is rushing to the aid of a neighboring town, or a train derailment has occurred. What frequencies do I listen to? I think the public service agencies refer to this as "disaster preparedness." I remember last year

when I literally drove by the burning inferno of the "Wholesale Liquidators Warehouse" in Lodi, NJ It took a good 30 minutes to get all the active frequencies loaded into my scanner and I probably missed a lot of good listening.

Just as we have fire drills, practicing what and how we would react in case of a fire, the serious scanner listener should compile lists of frequencies related to anticipated incidents at locations in your area. These might include:

1. Frequencies used by local hospitals.
2. Mutual aid frequencies.
3. DOT, DEA, DEP and FAA frequencies
4. Intra-town frequencies like SPEN 1-4
5. Marine frequencies
6. News Media frequencies
7. Red Cross frequencies
8. Local airport frequencies
9. FRS frequencies
10. Local Disaster Groups and "News Chassers"
11. Lists of your county's frequencies

I could go on, but I'm sure you get the idea. Better yet, it's time to think about house cleaning all those extra banks in your scanner. Or how about that extra scanner that you're not using? Program it up with these groups, just in case.

And one more issue we seldom think about..how about if the action is in your neighborhood and YOU loose power? Do you have any emergency power? Here's how I deal with that situation. It's a known fact that the RS 2006 runs a bit warm so I've always run it off an external 12V supply. Recently I acquired a 12V 10 AH gell cell. The battery powers my 2006 and I have a regulated 13.8 volt supply connected across the battery. Since gell cells are charged by constant voltage, they only draw current when the voltage falls below their ideal voltage (13.8V). The 2006 draws power from the battery and the power supply charges it. In the event of a power failure the batter takes over and I never see any interruption in scanning. I've run the 2006 for up to 10 hours and never lost a call! One final comment... be sure to place a diode in series with one of the charging leads so the charging supply does not discharge the battery if / when there is no AC power available.

USCG INFO

<http://www.uscg.mil/datasheet/dataindx.htm>

The U.S. Coast Guard uses a variety of platforms to conduct its daily business. Cutters and small boats are used on the water and fixed and rotary wing (helicopters) aircraft are used in the air. While monitoring, have you ever heard terms like "Buoy Tender", Jayhawk, or Endurance Cutter? Check out this site and learn all about it!

NJ TRANSIT INFORMATION

From a friend of mine who is "in the know", here a list of frequencies for the NJ Transit trunking system. Most of the lists I've seen list over 20 frequencies. My initial reaction was that the Uniden Trunk Trackers would not receive this system since the number of frequencies exceeded the 20 channel per bank limitation.

NJ Transit is reconfiguring to a 10 channel simulcast system in the north as follows:

System 4431

- ch1 868.4875
- ch2 868.4625
- ch3 867.9875
- ch4 867.9625
- ch5 867.4875
- ch6 867.4625
- ch7 866.9875
- ch8 866.9625
- ch9 866.4875
- ch10 866.4625

This is a Type I and Type II hybrid system. Right now Transit non-revenue vehicles are using Fleet 200 subfleets 1-15 and size code D. I don't have any info on the programming of the private bus companies, but may in the future.

The second system in the North is **Metrocom** (Conventional Sumulcast system used by the busses, but channel steering is accomplished via 2 dedicated data channels, 854.4875 (statewide data) and 854.2375 (north data, but only 2 locations active. Eagle Rock and Warrenville). The bus normally listens to the data channel and is instructed to switch to a metrocom voice channel to talk to a console. Currently only Met chans 2, 6, 7, 8 are active with the other 6 coming online soon (Currently chs 1, 3, 4, 5 are used for Trunking system AA31 which is going away)

Metrocom North

- ch1 860.4875

- ch2 860.2375
- ch3 859.4875
- ch4 859.2375
- ch5 858.4875
- ch6 858.2375
- ch7 857.4875
- ch8 857.2375
- ch9 856.4875
- ch10 856.2375

SOUTH

3 channel Trunk system BB31 as follows for non-Revenue Transit vehicles and private bus companies. Transit vehicles are Fleet 200 subfleets 1-15
SizeCode D.
ch1 860.3875
ch3 858.3875
ch5 856.3875

2 channel Met system using the statewide data channel for steering
Met1 859.3875
Met2 857.3875

Control channel for Trunking can be ch's 1-4 in north or ch 1 or 3 in south.

If anyone can come up with some Trunk Tracker settings please forward these to us here at the Urban DX'er.

DECODING SOFTWARE

<http://www.geocities.com/CapeCanaveral/Hangar/8539/INDEX1.HTM>

Check out links on this page for the latest in software to decode most anything. Included is software to decode GOLAY and FLEX paging formats, previously unavailable. Information on the required interfaces is also included. This is one of the best sites I've seen in a long time! Some of the information is in Dutch and there are many imbedded links so take your time and look carefully on each page you visit.

SCANNING THE NATIONAL PARKS SERVICE

New Jersey:

<http://www.geocities.com/CapeCanaveral/9952/nps.nj.htm>

New York:

<http://www.geocities.com/CapeCanaveral/9952/nps.nj.htm>

These two sites have lots of frequencies and "10

Codes" used by the National Parks Service - too much to put in the newsletter. These are certainly worth visiting and printing a hard copy for your files!

WHO'S WHERE ON SMR?

Tune through the lower 900 Mhz region and you'll find hundreds of data frequencies. Over the past few months much has been disclosed that these digital signals may soon be able to be monitored by the new software popping up on the net. If or when it becomes possible you'll want to know what services you are listening to. N2NOV did some database research and compiled the following list. Recent USENET postings and articles in Monitoring Times strongly suggest that many government agencies are now using these frequencies for their alleged privacy!

NEXTEL

856-860.0375, .0875, .1625, .1875, .5125, .5625
861-865.0125, .0875, .1375, .2625, .3625, .3875, .4125, .5125, .5375

861-865.5625, .5875, .6375, .6625, .7625, .8125, .8375, .8625, .8875, .9375

That's right. 125 frequencies and each able to hold 3 digital streams = 375!

BELL SOUTH

935.0125 - 935.125
935.7625 - 935.875
938.5125 - 938.625

3 groups of 10 channels are spaced every 12.5 Khz

MOTOROLA SMR

936.2625 - 936.375
937.0125 - 937.125
939.7625 - 939.875

3 groups of 10 channels spaced every 12.5 Khz

FCI 900 SMR

938.7625 - 938.875

10 channels spaced every 12.5 Khz

FLEET TALK

938.0125 - 938.125

10 channels spaced every 12.5 Khz

GEOTEK SMR

936.5125 - 936.625
936.7625 - 936.875
937.5125 - 937.625
937.7625 - 937.875
939.0125 - 939.125
939.2625 - 939.375

6 groups of 10 channels spaced every 12.5 Khz

PAGING NETWORK SMR

935.2625 - 935.375
935.5125 - 935.625
936.0125 - 936.125
937.2625 - 937.375
938.2625 - 938.375
939.5125 - 939.625

6 groups of 10 channels spaced every 12.5 Khz

BEACON TRACKING - THE EASY WAY!

Now that the winter weather has arrived the bands are getting much quieter. This is particularly true of the frequencies below the AM broadcast band where hundreds of navigation beacons send out their two and three letter identifiers. Newcomers always wonder where these mysterious signal come from. I've come up with an easy way to identify these and locate them. Here's how easy it is!

Lets say you are tuning around and you hear the "PNJ" beacon on 347 khz.

Start of by visiting

<http://www.microwings.com/mwaptnav.html>

Eenter "PNJ" in the Nav Aid box. Click, and the database tells us the following information....

PNJ

PATERSON NDB - PATERSON, NJ

Location: Lat/Long: 40-56-47.5N / 074-09-03.1W
(40.9465278/74.1508611)

Elevation:

Variation: 12W

Operational Characteristics

Type: NDB

Class: MHW

Z marker: no

Frequency: 347

Hours of operation: 24

Voice: no

Voice ID: no

Morse ID: .--. -. .---

Station call name: NONE
1 : MIV
FSS:
FSS hours of operation: 24

Technical Characteristics

Accuracy: NOS
Monitoring Category: 1
Owner: FEDERAL AVIATION ADMIN.
Operator: FEDERAL AVIATION ADMIN.
Common System Usage: yes
For Public Use: yes

Now, if you own a copy of Street Map or any of the other mapping programs you can input the exact longitude and latitude and find out exactly where the transmitter is located - that easy!

The search URL listed allows you to search by Identifier, Frequency, position or airport identifier. I'd be interested to learn what all this information means so if someone can define each term we'll pass it along in a future issue.
Have fun!!

AIR BAND FLIGHT TRACKING

How many times have you heard an aircraft and wondered where it was or where its headed? KB2SGJ passes along this site where you can graphically show an aircrafts position given the airline and flight number. The graphical version actually plots the aircrafts position on a map and appears to be updated about every 5 minutes.
<http://www.thetrip.com/usertools/flightracking/>

If you don't know the frequency of the local NY - NJ metro area airports visit my page at
<http://www.hili.com/~4runner/airports.htm>

SFO EARTHQUAKE 10 YEARS AFTER!

<http://www.sfmuseum.org/1989/sf911.html>
I came across something very interesting that I think a lot of you would enjoy listening to. It's a recording of the 911 system during the October 17th 1989 earthquake. I just listened to it now and its pretty crazy.

San Francisco 9-1-1 Dispatch Tapes October 17, 1989. Nothing caught the drama and confusion which initially followed the earthquake better than the 9-1-1 dispatch recordings. The Hall of Justice, at 850 Bryant St., sits on the edge of Marina-like Bay fill. The shaking was so terrible that some

dispatchers fled, and others became ill. Damage to the building was significant enough that some felt that the dispatch center must be evacuated.

Compounding the terror was the failure of electricity, as well as the automatic generator that was supposed to power the 9-1-1 center. Shaken, in the dark, and fearing that the Hall of Justice might collapse, these few dispatchers attempted to handle the flood of 9-1-1 calls - that was somewhat diminished because the Pacific Bell generator caught fire at the McCoppin Street telephone office which transfers emergency lines to the Hall, as well as to other emergency departments.

This tape, from the SFPD logging recorder, begins moments before the earthquake. There is a gap in the recording, just after the earthquake, because of the power failure. However, the tape restarts when the Hall's generator finally kicks in. Five-minutes of call highlights from 9-1-1 recordings can be heard here with RealAudio. The full fourteen-minute 9-1-1 recording, as transcribed, can also be heard in RealAudio.

(Note: After downloading the file, open RealAudio and use it to open the file. It will connect and start playing in just a few seconds.

Robert W. Sanford, WB6NYC
SKYWARN MARIN COUNTY

READER FEEDBACK

Allow Me to Intro Myself, Dan Johnson-kc2dhf-lslip L.I. I'm retired from Con Edison 12/97-volly F.f. & P/t Dispatcher Islip Fd. Reby Kc2ayc & Lima---member of L.i.m.a.r.c. Where I Got My Ticket from their weekend class 4/98.
Equip= Yaesu Ft50 & Icom 207h & Bc895tt & Regency Hx1500. Monitor Fdny-nypd-suffolk County Fd,pd & Ems-fdny*ems Et.al. I Down/printed Your Newsletter & Am Impressed.
Best Regards,
DJ- a.k.a. fdopspop@aol.com

The Urban DX'er would like to thank all those who contributed to this months issue!

Charlie - N2NOV, "R", Morris Torf, KB2PGE, Eddie Muro, KC2AYC, Ryan Holly, Bill. KE4IDU,

GPS RECEIVER COMPARISON

by Joe Mehaffey and Jack Yeazel

There have been many new low-cost GPS products in the last six months. The GPS receivers and map software are also getting more features. The following is a description of the most popular hardware and software. Since individual products don't contain all the features available, hopefully this review will allow you to be a more informed buyer.

GARMIN HAND-HELD RECEIVERS

All current models have a 12-channel parallel receiver and acquire lock and track much quicker than the G-45(XL) and G-II. They are much more reliable at tracking in mountains and heavy tree cover. Also the 90 knot restriction of the G 45(XL) has been eliminated. Garmin specifies an accuracy of 15m rms without SA. The version (v.) number quoted is the current version.

The **G-12XL** (\$250 v. 3.02/3.52) was introduced in January 1997 to replace the single channel G-45(XL) v. 3.50, the GPS-12 "Little Brother" (\$175 v. 4.0) in June 1997, the GPS-II+ (\$250 v. 3.00) in April 1997, and the G-III (\$360 v. 2.05) in Oct. 1997.

The first three are similar in function and features, but the more expensive G-III is a completely redesigned unit housed in the G-II+ case. The biggest difference is an included map of all the Interstate, most of the state routes, railroads, rivers, and shorelines in the Western Hemisphere with seven levels of detail. An International version contains road maps of most countries in the rest of the world. A more detailed description of the G-III is below.

Basic features of the hand-held Garmins are:

At least 500 way points storage, 20 routes of 30 route points, and 1000 track points (1900 with the G-III)... All have a Track Back feature that converts a track to 30 route points providing steering directions to navigate the Track Back route -either way. All current units have icon symbols for way points. Erasure of Track Back way points is now easier with "delete by symbol". Track Back routepoints are simple "T" Icons (or "foot prints" in the G-III) which don't clutter up the map near as much as the serialized "T****" route points. All have a serial data/external power capability. A "three-way" cable provides for both.

The receiver performance in the Garmin GPS receivers is good enough, so that in many cases an external antenna will not be necessary. Reports indicate that you may need an external active antenna to maintain continuous coverage under difficult terrain and tree cover conditions. Garmin makes three active antennas, the GA-26 and GA-28 for the G-II/G-III series receivers BNC connector and the GA-27 for the G-12XL MCX connector. (The GA-28 pole mounted 'marine' antenna comes with a 30' cable). An MCX to BNC adapter cable is available if necessary.

Some general differences are:

The G-12 and G-12XL have internal antennas. The G-II+ and G-III have rotatable external antennas with a BNC connector. The G-12XL, G II(+), and G-III have powered jacks for remote antennas, but the G-12 has no external antenna capability.

The G-12XL is the only model with an audible alarm. Only the G-II+ and G-III have rotatable screens (Horiz. or Vert). The G-12XL (v. 3.02) and G-III units run about 10 hours on (4) AA alkaline cells, while the G-II+, G-12, and G-12XL (v. 4.00) run about 20 hours. All Garmins will accept external 12vdc power and serial data through a four pin plug, except the G-12, G-38, and G-40 which require a voltage regulator. See: Garmin G-II+ Review & Garmin G-12XL Review

Garmin G-III (v. 2.05) is a new dimension in GPS receivers. The G-III is a significant design change and incorporates a 386 processor. Screen resolution is increased from 60x100 to 100x160 pixels with four shades of gray. In addition to zoom keys, the map can be jumped to any waypoint or routepoint and panned from that location. An interesting feature is to view the selected route in "3-D". You see a winding "road" with or without routepoint "signs".

The track function has been greatly expanded. The active track can contain 2000 track points which can be compressed into tracks of 250 "best" track points. Up to ten compressed tracks are possible, and all (or selected) tracks can be shown on the map page at the same time. Track resolution is now ADJUSTABLE. Most pages have user selectable fields of data with 25 items available for each field. Waypoints can be assigned any of 47 Symbols, and several types of user timers are available.

The route function has been re-designed, so that they are listed in alphabetical order. Routes are best created by clicking on waypoints. The old "automatic route creation" by Marking isn't available. And so far, setting in a position in the Simulator mode (as in other Garmins) to check out map software isn't possible.

The unit has lighted keys with three levels of back light. Font size of displayed labels are user selectable and for important navigation information are quite large. The map is reported to be loaded in only 4 MB of ROM. This version provides display of individual saved tracks.

See: Garmin G-III Mapping GPS receiver -Product Review

Software Compatibility:

All Garmin hand-held receivers are compatible with all the map software programs we have tested that use the NMEA 0183 Ver. 2.0, 4800 baud standard for real-time tracking. Stored routes, way points, and tracks can be down or uploaded to the receiver (with a \$30 serial port cable) using the GRMN/GRMN protocol.

Garmin PCX5 program (\$75), is sold to down/upload stored data information, but the authors have found only two map programs that recognize it (Vista and Loran/GPS). The G-45(XL) requires PCX5 Ver. 2.06 while the G-12XL requires PCX5 Ver. 2.08. It's not known if later models of the 12XL with icons are compatible with a version of PCX5.

However, there is a large body of third party software, such as G7TO and Waypoint+ (see reviews below) that are compatible with the Garmin protocol and are designed to download stored Garmin data to Delorme Street Atlas 3/4/5 and archive text files. Fugawi works well with scanned maps, and Ozi Explorer works best with the USGS DRG maps. For displaying real time tracks on vector maps, Vista by RMS Technologies and Precision Mapping 3 work well.

GARMIN CHART-PLOTTER RECEIVERS:

Garmin Street Pilot (SP) v.2.01: This \$550 (plus \$100 TO \$200 per MetroGuide map cartridge) receiver at first sight looks like an 'inflated' G-III. However, in its ample interior are some significant hardware and software innovations. A summary of the major new features are:

- A. ETAK highly accurate street level maps on Garmin StreetPilot cartridges
- B. Selective Availability (SA) 'eliminator' keeps tracks ON streets
- C. Large high resolution screen (160x240 pixels)
- D. Point-to-point route generation (with Street Atlas 5.0)
- E. 'Rubber-banding' route segments attach to the street curves
- F. Route guidance with large arrow that anticipates turns and street bends
- G. Map changes zoom level when approaching route turn
- H. Cartridges list user attractions, motels, restaurants, etc. near current position
- I. Automatic inverse video amber backlighting at sundown
- J. Automatic zoom level in Navigate mode
- K. Automatic daylight saving time adjustment

- L. Automatic NMEA/GRMN data transfer selection (not verified)
- M. Automatic power-down on loss of external DC power
- N. Position indicator carries a 'circle' indicating estimated error
- O. Driving Status text at top of map describes present location and up-coming turns
- P. Map finds selected street addresses Street Pilot requires the help of outside software to indicate the quickest point to point routing. The procedure is to use Street Atlas 5 (SA5) to determine the desired route and upload it to the SP. Care must be taken to place any SA5 'stops' directly on street intersections. A mismatch between an SA5 and an SP intersection will not allow the route segment to 'rubber-band' (attach itself) to the curves of the road. However, 5% or so, of the uploaded route points that are not exact can easily be 'edited' in the Street Pilot to the proper location allowing rubber-banding the whole route. Routes can also be generated without SA5, by indicating the beginning and ending points on the SP. However, the route must be manually 'attached' to selected intersections to make an effective route.

From here all that's required is to 'Start Navigating' and select the forward or reverse route. As you drive along, the map will zoom out to show the 'big picture' until approaching a turn. Then the map zooms in to better indicate what maneuver is needed just ahead. The large arrow keeps a running indication as to curves ahead and the direction to turn at the next intersection. This is most helpful when traveling south on a north-oriented map! Map detail is adjustable to avoid clutter. The text at the top of the page gives the FULL name of the approaching street, not just the six characters provided by SA5.

You'll quickly notice that the position marker doesn't wander off the street due to SA. Without this feature, due to the density of the map streets, SA would not allow one to know for sure which street they were actually on. The SP allows only 100 way points and 500 track points. Way points and Route points can be listed with the nearest first or alphabetically.

Street-Pilot Software Compatibility:

Street Atlas 5: Can upload routes and draw-objects to the SP (limited to six characters of a serial number plus letters). SA5 cannot download anything but a track from the SP. G7TO (3.02.23): Can download (the last listed) Route, Waypoints and Tracks from the SP retaining the 10-characters in the Waypoints and Routepoint names. During this process G7TO can create .SA5 files that show the data on Street Atlas. G7TO can also upload these files back into the SP with the 10-character names and original Symbols preserved. Routes that rubber-banded before downloading will rubber-band again after uploading. Screen-capture of SP screens is provided, and old 6-character archived way points can also be uploaded. Waypoint+ (1.7.06): Can only download tracks from the SP. However, archived Waypoints, Routes (with 6-character names), and Tracks can be uploaded. See: Garmin StreetPilot Mapping GPS -Product Review

Garmin GPSMAP175 GPS Receiver:

This \$700 GPS receiver is a little different breed from the low end models listed above. This model is essentially a G-12XL receiver (with the same basic features but also with a display almost three times the area and with better resolution as compared to the G-12XL. The unit also has optional plug in memory cartridges which can provide detailed marine charts and moderately detailed highway road maps all in one "brick" sized 20 ounce unit. The built in map feature will be useful to Mariners, but those who are used to Street Atlas and similar vector road maps will be disappointed in the road detail.

The GPSMAP-175 has a parallel 12 channel receiver. It provides fast satellite lock on similar to other 12-channel receivers. The GM-175 does not have the G-12XL's way point averaging feature. Battery life is

about 10 hours on six AA cells and the unit supports an external amplified antenna. The GM-175 is compatible with Software designed for the G-12XL and the G-45XL.

See: Garmin GPSMAP-175 -Product Review

LOWRANCE RECEIVERS:

1) Lowrance Eagle Explorer: "EE" (\$150) and GN 200 (\$245) GPS receivers: This EE review applies ONLY to those with firmware revision 1.4 or later (1.8 is current). This firmware revision has substantial improvements over prior versions particularly in the area of working with moving map software packages. The EE is a parallel 12 channel receiver which acquires lock faster and is more reliable at tracking in difficult conditions as compared with single and dual channel scanning receivers. The EE does not have an external antenna connector. The receiver sensitivity on the EE (and the G 12) is so good that most will not require an external antenna.

The EE operates for about 6.5 hours on 4 AA alkaline cells and can also be operated on an external power source of 9 to 16 volts. A useful feature of the EE is that it can accept a rechargeable NiMH battery which can be automatically recharged when the unit is connected to external power. The receiver provides NMEA 0183 protocol versions 1.5 and 2.0 which (infirmware version 1. 4) is able to work with most moving map software. (Note: The EE's simulator mode works only with Precision Mapping 3 and Ozi Explorer map software which ignore the 'invalid' flag.)

The EE has a complete feature set including a plotting capability. Of special interest is an array of fifteen user selectable screens which provide various combinations of BRG, DIS, TRK, GS, ALT, TRK, ETE, VMG, ETA, or CDI. See: Eagle Explorer 1.4 -Review

2) **GlobalNav Sport and AccuNav Sport** (Comments by Ron Wilson): Both were good 5-channel parallel receivers, but the newer 12-channel units like the EE, Eagle Expedition II, and GlobalNav 200 & 212 are smaller, have more features, longer battery life, work better under tree cover, and cost much less. The GlobalNav 212 is comparable in features, performance, and price to the Garmin 12XL. The Eagle Expedition II is a little cheaper, but does not come with the capability of an external antenna.

3) **Eagle Expedition II:** A review by Andrew Kalinowski. Basic features of the Eagle Expedition II and Explorer are the same. Major improvements in the EEx2 are in the memory and software. The EEx2 can store 750 waypoints + 1000 events with 28 icons to choose from. Also display of three plot trails of 3000 points each can be selectively turned ON/OFF, so they are useful for storing crude base maps. Plot 0, the active plot, can be saved into Plot 1 or 2 which then can be down/uploaded to/from the EEx2s individually.

Major software improvements over Explorer are: Position averaging, Sunset/sunrise, and moonset / moonrise calculations. Silent alarms (flashing backlight) work great at night, when driving. Improved screen organization includes the battery indicator on the satellite-status screen. That screen is now accessible directly from "pages" menu, without going into "groups" menu. Three (instead of 2) plotter screens. The new screen has a window in the bottom with a neat bearing arrow and shows the Icon and name of the GoTo waypoint. Estimated position error is shown as a distance and replaces the ambiguous "quality of position" indicator.

A Power-saving mode allows the unit to run for over 20 hrs on one set of batteries. Sensitivity is somewhat lower and errors much higher when in this mode. Tests have shown that the EEx2 does not have as good sensitivity as the Garmin 12XL 4.00 and later models. With power save OFF, batteries last 10-14 Hrs. depending on the brand. The unit is easy to handle and operate. Accuracy is not specified.

See: Eagle Expedition II Compared to the Garmin 12XL -Review

Software compatibility: Without any problems the unit worked with: Microsoft Trip Planner 98, DeLorme AAA

Map-n-Go, Chicago Mapping Compass, GPSS, Fugawi, and OziExplorer (which was designed specifically to work with Eagle/Lowrance units) deserves special attention of Eagle/Lowrance users. It allows to effortlessly create, edit, download and uploads waypoints, events, plots and routes using scanned or a blank map.

4) Eagle AccuNav Sport, \$299 (thanks to Glenn S. Wiltse): AccuNav Sport has an LCD screen that is about twice the size of the one on the 12XL. It has a numeric keypad that makes many functions such as entering waypoints much easier than on units without a keypad. The Keypad on the EAS is also lighted when the screen backlight is on. The EAS will run 4 to 5 hours on a set of 6 AA batteries. The EAS supports only one coordinate system. The unit is about twice the size and twice the weight of the GPS 12XL.

The EAS can be connected to your cigar lighter with an inexpensive cable available at Radio Shack. The EAS Ver. 1.4 is compatible with the FUGAWI scanned map program for up/downloading waypoints and routes

5) **Global Map 100: v. 1.1** (Thanks to Ira Wilner) \$449, including the map CD, data cable, and cigarette-lighter power, is the size and basic function of the Eagle series receivers which won't be repeated here. A trend-setting feature is that maps stored on CD-ROM can be uploaded into the receiver by the USER. All the IMS Smartmaps originally available on single cartridges are now available on one CD-ROM. The basic built-in worldwide and North America background maps are quite detailed having all major Interstate Highways and many numbered state roads and the smallest rivers. The mapping data seems to be waterway heavy.

The IMS Smartmaps on CD-ROM add additional county roads and just about every brook and stream. Street level details are omitted. The maps are no substitute for SA-5 or paper street maps. However, highway intersections including the on and off ramps are all there as are the names of virtually all the towns. Lowrance has announced an upgraded CD-ROM package with much more rural road detail and the ability to create custom map files for upload. (See the screen shots of the new MapCreate CDRom system [HERE](#).) In order to display the new map data, the screen resolution has been increased to 104x160. Unlike the Eagles, an un-powered MCX antenna jack is provided for a remote antenna, and the distance-to-go box reads in miles and then switches to feet as you approach your target waypoint. Now most screens can be customized.

The GM-100 has a fairly detailed background map of the entire US mainland major highways and rivers. When you download an IMS map segment, the display will use the higher detail when the magnification range is appropriate. The receiver has memory for two IMS map segments. Below 15 mile magnification range the display will favor the IMS detailed map section even if your current position cursor is in the background map section. Zoom out beyond 15 miles and you will force the display to choose the background map instead and you regain details around your cursor position and beyond.

The background map will drop all details when you zoom in below 3 miles. The IMS map segments allow zooming down to .1 mile. The partitioning of the US mainland into IMS maps appears to have been done in a manner that attempted to fill each segment with all the data it could hold. Remember that this data was originally written to ROM cartridges. Thus the segments often traverse awkward political boundaries not conforming to one State. But the solution is on the way. Lowrance has announced a new CD-ROM with enhanced software that will allow you to create map upload files with whatever boundaries and details you wish as long as the file size does not exceed the memory limit of the receiver.

See: Lowrance GlobalMap 100 1.2 Receiver Review

MAGELLAN RECEIVERS:

1) Magellan GPS-4000 (& XL versions): This \$250 receiver has good display features and acquires satellites reliably except in dense woods or close to hills causing reflections. It has a \$50 accessory

to permit connection of external DC power and an optional external amplified antenna at about \$100. This unit has about the best battery life at roughly 17 hours (24 hours with the newer XL version) on one set of 4 AA batteries.

This unit has a two-channel multiplexed 12 satellite tracking ability (advertised). However, we note that when one of the four satellites it is using to provide data suddenly becomes unavailable (such as when you go behind a hill or a building) the GPS 4000 must go through a reacquisition sequence even though the status display indicates it is "tracking" 8 satellites. This reacquisition can take 30 to 120 seconds depending on conditions. However, a TRUE 12-channel version of the 4000XL has been produced without changing the name. The only identification of these receivers is by the Model No.: 00-62014-010.

2) Magellan GPS-2000XL: It is the survivor of the old M-2000/3000/4000(XL) line. It incorporates most of the features of all three products and includes a sensitive 12 channel Parallel receiver. The M-2000XL can upload/download waypoints using Ozi Explorer and Street Atlas 5 mapping software. This unit is robust and provides user features quite similar to Garmin's G-12 (not XL). Disadvantages: The batteries must be removed and an adapter module installed in order to operate on external power, use an external antenna, or connect to a computer.

See: Garmin G-12 Compared to Magellan GPS-2000xl and GPS-4000

3) Magellan ColorTrak: v 2.01 (Thanks to Dale DePriest). The colortrak has a color display, external alarm support, a pressure sensor to improve altitude readings, a back-lit keypad and a carrying case. The battery compartment is actually two independent halves that you must unscrew to remove the batteries. They seem to be two parallel sets so the unit must run on 3 volts and in a pinch it could be operated with only two batteries. Many screens now have additional data and match their Garmin counterparts instead of the older single function screens. The plot screen still looks and works like the older units except that it now has icons, a long track log and the ability to show a single distance circle similar to the 3 Garmin circles.

There doesn't seem to be an active route screen in the rotation and I wasn't able to determine how to review route data very well from my brief encounter. The screen is definitely taller than a Garmin screen. The interface looks like a Garmin connector except that it has 5 pins. There is a simulator mode on the system menu. It has two settings, one automatic for training and one user mode that you can specify the speed and bearing.

Other notable features are a graphic indication of the position of the sun and moon so that you can use the unit as a crude compass while standing still, automatic position averaging (as compared to Garmin's manually initiated pinning feature), and a battery gauge that seems to do something more than just measure voltage. One feature that the 4000XL had that seems to be missing from the new units is the ability to set a waypoint by measuring inches or centimeters on a map.

(The following text by Anonymous Engineer): The "altimeter" in the ColorTrak is not really an altimeter, but is a pressure sensor that is used to help the software decide whether the change in GPS altitude is a real change in altitude, or is just due to SA or other physical effects. The pressure measurement is examined for changes and if the GPS jump is large and varying (say jumping up and down as frequently happens with SA), then the 3D solution is damped to reduce the motion in altitude. On the other hand, if the change in altitude continues, then the altitude is allowed to continue in the direction indicated. The GPS will indicate the 35,000 feet that your 747 is at, despite the cabin pressure of 6000 ft. The GPS computed altitude takes precedence, just that the variations are damped. Most Magellan receivers will not show altitudes below sea level "to reduce boater complaints".

See: Magellan ColorTRAK Receiver -Review

DELORME RECEIVER:

1) Delorme TripMate GPS Receiver: This \$150 receiver (bundled with Street Atlas 5) is a 12 channel receiver/antenna combination, but has no display. It is "rain resistant" and so may be itself mounted on your car's roof. The TripMate GPS receiver is designed specifically to work with Delorme's Street Atlas 4.0/5.0 software and unless connected to a laptop with SA4 running, the TripMate shuts down and provides no data. This unit acquires quickly and maintains lock well. However, its lack of a stand alone display, and the fact that it only works with Delorme Mapping software products makes it less desirable than others. Speed capability is reported as 900 kph. The Tripmate has been reported to be the least accurate of the low cost GPS receivers GPS to MAP Intermediate Software:

Third party software is essential to realizing the full potential of integrating the Garmin receivers with the Delorme Street Atlas maps. These auxiliary programs allow you to download routes, tracks, and waypoints to files that can be shown on the Delorme maps, white paper maps, or saved for future uploads back to the Garmin receivers.

1) G7TO302 is a (free) DOS program by Ron Henderson. The program will download in one operation from the Garmin receivers, waypoints, routes, proximity points, tracks, and symbols (if they exist) to text and Street Atlas 3/4/5 files in all the various ways Street Atlas can present these data.

Just when G7TO was updated to support the G-III with 47 Symbols, it has once again been upgraded to keep up with the designs of Garmin. Version 302.23 now supports the Street Pilot's 10-character waypoint and routepoint names for down/uploading and display. The interface with the Street Atlas 5 isn't finished, but G7TO is the only option available. Upgrades will be available at G7TO302 above.

You have complete control as to how any downloaded track or route LOOKS in Street Atlas. It can be solid, or 'highlighter', and be any SA color or thickness. Routepoints can have Route No., names, comments, or none. Waypoints can have names with or without comments. SA4/5 Tracks are lines instead of dots; SA3 tracks remain dots.

An added feature to this version of G7TO is the ability to convert very large track .TXT files (up to 32,767 track points) to an SA5 file. Long tracks can be made by adding several track.txt files together with the DOS COPY command. The track files can also contain Waypoints and Routes. Check: The latest G7TO Instructions

2) WAYPOINT+ Ver. 1.7.06 (free) by Brent Hildebrand is a very sophisticated Win 95/Win-NT (only) program for use with the SA 3/4/5 Delorme maps. This version has had an extensive upgrade in the user interface and will now print the 'white-paper' maps. The program will down / upload Tracks, Routes, Waypoints, Proximity Waypoints, and Symbols of thirteen different Garmin receivers. Once downloaded, a click on the file, created (in Windows Explorer) will invoke the Delorme map program associated with it and display file data on the map automatically.

The program presents the waypoints and routes in three ways:

- A) As Delorme SA4 "Map Notes", (balloons without a dot)
- B) As Delorme SA4 "Places", (names with a dot)
- C) As ovals on the Waypoint+ white map (with or without names). A large variety of Lat/Long grids can be added to the white paper map. Multiple datums are supported, and UTM coordinates may now be selected for the cursor readout on the white-paper map alongside the Lat/Long grids.

A handy feature of the program its ability to COMBINE all of the data stored in the Garmins into one file. This combined file can either be displayed on the white paper map or on an SA3/4/5 map. Route 00 (the active route) will be displayed on SA4 as gold circles connected by SA4's "railroad track" lines. Proximity waypoints are shown with limit circles around them.

Tracks on SA4/5 can be shown as continuous lines in color or as points. Saved files can be edited to

remove or add waypoint and track information. SINGLE waypoints can be 'Sent' to the receiver from a list of waypoints with Ctrl-S.

3) Garmin's PCX5 (Ver. 2.08). This (\$75) program will down/upload tracks, way points or routes between the Garmin receivers and a computer. However, these data are presented on a crude map of the USA (with only the states outlined) or a Mercator of the world. As far as we know, this program is compatible only with the Vista and Loran/GPS programs (indirectly).

Vector-Map Software:

1) Delorme Street Atlas 5.0 (SA5) is a \$25 upgrade from SA4, (or about \$50 otherwise.) Two CD ROMs of SA5 have many new enhancements which add substantial utility to the program. These include, but are not a full list:

- * Address to Address automatic routing.
- * GPS Voice Navigation directions.
- * Improved GPS Interface with Garmins
- * Map n Go city to city routing
- * Support for Lowrance tracking
- * Palm Pilot PDA support
- * Points of Interest.

Address to address directions are not for just the current city, but for the whole USA. That is, the quickest route from 1 Beacon Street, MA. (02111) to 1 Market Street, San Francisco, CA (94111) is quickly calculated. The calculated routepoint directions can be uploaded to the Garmins as logical routepoint NAMES unlike serialized DM0** NUMBERS with SA4. The complete route point text appears in the Garmin Comments to the limit of 16 Comment letters. These routepoints are "spoken" as you drive along giving several "warnings" approaching each route point.

The "avoid this route" can be activated by drawing a circle of avoidance around the area to be avoided. An easier way is to "Edit" a road to be "No Way". Conversely, a route to be included can be set with a right click on it. (However, we found that you could instruct SA5 to avoid secondary roads in favor of more major roads and it would still choose the secondary roads when a primary road or freeway was shorter and quicker.)

For the first time in Street Atlas history, Garmin Waypoint NAMES can be downloaded and "Draw Object" way points containing Lat/Long with names and comments can be uploaded. Stored tracks can also be downloaded, but the tracks are excessively large green high lighter lines. However, these tracks can be edited to an acceptable size. When a Route is calculated, the route points are given specific logical names (not just serialized numbers as with SA4) which can be uploaded to Garmins. Routes can also be downloaded, but the points are not connected by lines.

Automatic Pan, logging, tracking are now supported. Points of Interest include restaurants, hotels, gas stations, Radio Station Listings along your travel route, etc. Edit Roads allows you to specify roads one-way, no-left-turn, etc. Palm Pilot PDA is now supported in consort with a main computer.

You can search by Lat/Long, placename, phone number and address. Unfortunately, a search for an address MUST include a zip code. A street and town name is not sufficient. Finding the zip code of an address is performed with a right button mouse click on the map to create a Zip code NapNote.

NOTE: All Delorme maps can be printed. The G7TO and Waypoint+ waypoints, routes, and tracks downloaded to Delorme maps will also be shown on the prints.

See: Street Atlas 5 -Review

2) Precision Mapping 3.02 (PM3) with GPS Link 3.01 GPS software (Link 3.01 is free download from Chicago Mapping Co.): (This program also comes bundled with the Eagle Explorer Ver. 1.4 including cables for \$300). Up until SA4 came out, PM2 was the best low cost moving map software available. Now PM3 is a vector map program that surpasses SA4 in features and compatibility. The software provides total USA road coverage from the most up to date data base available in inexpensive maps. PM3 is able to up/download waypoints and tracks from the Eagle Explorer, Ver. 1.4. but only waypoints from the Garmins. Apparently PM3 is the only vector-map program we have that recognizes the EE Simulator Mode.

A real time track plot is displayed by up to 200 large red dots with a large real time heading arrow (the same size as SA4), but it only displays eight unique headings. Waypoints retrieved from the receiver are nicely displayed with names, and retrieved receiver tracks have a wide "marker pen" appearance. A sky view of the satellites is the best we have seen.

The maps in PM3, however, have less vector resolution than SA4/5, ME2, and Vista. About 10% of the two vector "curves" in SA4/5 and Vista are single vector "curves" in PM3. The basic "PM3" maps can be printed, but the GPS-mode "Link" maps cannot be printed. Other features available in PM3 aren't available with GPS Link.

The software package works well and is very intuitive. A Search function allows location by Zip code, Area and Exchange code, and Place Names. You do not have to have an on line CD ROM drive with PM3, since individual states can be loaded to the HD. It DOES work with Magellan's NMEA 0183 data stream on both the GPS 3000 and 4000 as well as the Garmin and Eagle products the most compatibility of all the vector maps we have reviewed.

3) Microsoft AutoRoute 5.0 (AR5) for Europe (a separate version for the UK): It has maps for most of Europe with a number of interesting features. In addition, it provides automated route planning, an interface for GPS input, and a "find a town" feature among others. It provides information on campsites, museums, and other points of interest. It even has a foreign language phrase book and photos of a number of landmarks and tourist attractions.

The major missing item with AR5 is GOOD MAPS, especially the city maps. Unlike Map-N-Go (USA), there are no auxiliary city maps provided. Only the major highway routes and a few other streets are shown on the AR5 city maps. Even the city streets shown are not usually named. By comparison with the AR5, the Delorme SA4 and ME2, and Precision Mapping products have almost every town with a name shown if you expand the map. AR5 maps fail to name most smaller villages. Also, AR5 maps are often in error by 500 meters making use for city navigation a challenge.

The AR5's "Find a route from city A to city B" feature worked very well. It will call your attention to tourist attractions a specified maximum distance off your track which will be a nice feature for first time visitors to Europe. The route feature permits a from/to with any number of intermediate cities so you can plan your itinerary with personal interests in mind See: Autoroute 5 GPS Compatible Moving Map Software -Review

Scanned-Map Software:

These programs are able to convert almost ANY paper map into a GPS raster map. The map doesn't even have to have any Lat/Long notations on it. The procedure is to scan in the map and export it as a .GIF or .BMP file to the map program. Next you use the "register" function to record the Lat/Long of identifiable street intersections on the paper map. This can be done by matching intersection Lat/Longs determined by PM3 or SA4/5 with the paper map. After registering the map with two to four determined positions, it becomes a perfectly good GPS map on which the GPS data can be accurately displayed. Even aerial photographs may be scanned and used as maps.

1) Fugawi v. 2.16 (Sam Rea) is a \$95 Windows scanned-map program which can upload/download,

waypoints, routes, and tracks (vividly displayed in COLOR) with the Garmin and current Eagle/Lowrance receivers. Waypoint names are shown on the map next to easy to see small yellow squares with the names in black on green. (All colors in Fugawi are user selectable). Placing the cursor over a waypoint causes its Description to be displayed. A sky view of the satellites is included.

A double click on the map creates a waypoint which can be used as part of a route to be uploaded to GPS receivers. The scanned maps will switch automatically as you travel along. Routes are drawn with red lines, and tracks are blue linked cookie trail dots. The GPS present position icon can be selected from several and will rotate as the direction of travel changes. Fugawi allows the GPS to be continuously set to WGS-84 while the map datums are converted by the software.

The program shows both GPS and cursor location in Lat/Long and UTM coordinates at the same time. This program is easy to use and easy to SEE, plus the maps re-center quickly. As of version 2.0, Fugawi can load the new USGS DRG maps in seconds. A unique feature is that the DRG maps are switched automatically at the "neat" line instead of waiting until the present position is completely off the map, as in other programs. This latest version allows control of printing any portion of the loaded map without any loss of detail. Fugawi now has Canadian topographic maps available in the BSB format on CD.

NOTES: One must remember to select Track/Record in addition to Track/Show in order to display the real time track. With waypoints "Save on Exit" turned ON, all waypoints can't be cleared from the maps on re-load unless ONE waypoint remains.

2) Ozi Explorer v. 3.63e (Des Newman) \$50US is similar to Fugawi with some added desirable features. The first thing you notice is how fast it can import a CD of USGS DRG maps (30 seconds vs Fugawi's seven minutes). The next thing is how easy and fast it is to pan the DRG maps. One click on the index map re-positions the main map instantly. You can also re-position the map by "dragging" it.

Ozi allows you to leave your GPS on the Datum of the map so that you can observe the lat/lon the same datum on both the GPS and the computer; the coordinates of which will then be the same. This approach requires that you remember to change the GPS datum when you change to maps with different datums.

Ozi doesn't recognize BSB charts or maps scanned in the GIF format as does Fugawi; the map file must be in BMP, packbits TIF or JPG format. Unlike Fugawi, Ozi shows tracks and waypoints on the index map and can upload an individual waypoint by clicking on it. Ozi supports Garmin Symbols up through the G-III. Ozi can register maps at nine points providing a better correction for distorted maps where Fugawi registers only three. Both programs switch maps at the neat line.

Up to 20 routes in different colors plus the Garmin Symbols can displayed by Ozi. (Fugawi displays one route and no symbols.) Custom track logs can be created by Ozi but not Fugawi. In the above version, Ozi can now print the maps to any desired pre-determined scale or coverage without loss of detail. Fugawi also prints without loss of detail, but it's difficult to predict what will be printed.

See: Comparison Between Ozi Explorer and Fugawi.

3) Vista (Ver. 1.21) by RMS Technologies (\$199): This program can display and record real time GPS tracks on scanned raster maps, Vista Flight Sectional raster maps (\$99 extra for each half of the USA), and Vista street vector maps. It works with any NMEA 183 GPS output, including the Magellan. The tracks recorded by Vista can be played back in seconds.

Vista can show a vector map, a flight sectional, and a terrain profile at the same time! (Included with Vista is the geological elevation data for the whole USA to a resolution of 3,000' horizontal and 100'

vertical.) Thus the terrain profile between any two points in the USA or that in front of the direction of travel can be displayed in a small box.

Vista vector and raster maps can be installed on the hard drive one "square" degree of Lat/Long at a time to eliminate the need of a CD ROM. Vista maps CANNOT be printed. In order to display Garmin Waypoints, Routes, and Tracks on the Vista maps as Overlays, one must purchase the Garmin program PCX5 (\$75) and obtain GARMIN.EXE (free) from the URL above.

3) Nav Master III (\$180) by Main Course Productions. This marine GPS map program handles the new USGS DRG and BSB maps very well. It's main utility is that its maps can easily be printed. It can download Routes, but not tracks and waypoints, stored in the Garmins (unless the waypoints are attached to a route). The "ship's" (scalable) icon rotates with direction and "predicts" its future position in user selected seconds. It even displays the rate of turn. It's unknown at present if additional "terrestrial" features will be added to the program.

The program is designed to be used "audibly" in a steering house without needing a computer there. Pre-planned route progress and directions are spoken by the program. Route-segment's bearing and distance are shown on the map display. If a computer is used at night, the screen can be dimmed by several degrees, plus red.

4) Navigate GPS Ver. 2.0c (demo or \$30) by Paul Mouland is a Windows program that uses scanned PCX maps to plot real time Garmin tracks. These Track plots can be saved and played back instantly or in the "real time" they were created, loading and changing maps automatically. (The track "dots", smaller than the Delorme "Very Small" circles, are a little hard to see). Routes can be created on the scanned maps which will give steering instructions both with a colored line plot, and by VOICE. Route ETE, bearing, and heading data can be displayed on the bottom of the map. A demo version is available on the URL below:

5) GarLink from EasyNav by Peter Aigner (Ver. A.02.00) is a Windows program that presents G-45 track, route, and waypoint data on a white map. It also shows a history of the speed at which the tracks were recorded. (The author requires a trial period license.)

6) GARtrip from Shareit by Heinrich Pfeifer (Ver. 114, US \$30) is a Windows program that presents Garmin waypoint, route, and track data on a "white map" suitable for analysis and printing, true to scale. The program supports the Garmin G-12 and G-III symbols. One feature includes converting coordinates from/to: Longitude/latitude, UTM, German Grid, Swiss Grid, French Grid (Lambert), British Grid, Irish Grid, Swedish Grid and any number of user defined grids, all with the proper geodetic datum. The program shows and accepts great circle distances between waypoints. Advanced route planning with speed and time is included, and for avionics GPS receivers, routes may include avionics database waypoints. Units of metric, statute, nautical can be selected. GARtrip imports and exports Garmin PCX5, Gardown, Garlink files suitable for editing and uploading into the GPS.

Others:

1) GPSS Moving Map by Robin Lovelock of Sunninghill Systems: GPSS is now running in 95 countries, and you may download the software, and mapping for these countries from the web site. You may also download sound files to make it speak Japanese, Russian, Italian and other languages in addition to English. GPSS is issued free to the public as a means of contacting businesses around the world who supply it in large quantity, or use it for more specialized remote tracking applications such as Inmarsat-C satellite communications.

GPSS will run on any modern Notebook PC running Microsoft Windows connected to any GPS receiver with NMEA output. The system provides the ability to ride along as your co pilot while your multimedia equipped laptop tells you where you are and what the landmarks ahead are. A demonstration program

sequence provided with the software demonstrates this ability. It calls out service stations, intersections being approached and the like. GPSS can accept user scanned maps and one demonstration showed a topographical photograph used as a map of the streets in a town. GPSS can also playback a track log in PCX5 format.

The free USA maps provide displays of the major highways and street-level detail in limited parts of the USA -in response to e-mailed requests from GPS users. The program supports a verbal command package for computer control as you drive along, but this is from another supplier at \$50US. Software support for the US Tiger data is available from the web site. The audio output tells you where you are about every two minutes. This is really interesting for awhile, but annoying as time passes. There is no way to adjust the announce interval, but you can turn the audio on your computer off.

2) ETAK SkyMap PCMCIA Card GPS/Moving Map Display System: For those who have been looking for a vector map system with higher resolution and map accuracy, take a look at the \$300 ETAK SkyMap system. It is a system designed for automobile navigation with the use of a laptop computer and includes the ETAK PC Card GPS module, an Infrared Remote Control as well as a comprehensive map of the USA.

The map itself is the most accurate vector map we have reviewed. SkyMap offers the feature of locating a specific metropolitan area address for you. An address (including optional house number) along with city, state and zip code is input. The program can then place a "map tack" on the specific location. Our tests showed that this feature requires a SPECIFIC address, and will not respond with any options for SIMILAR addresses.

A comparison with Street Atlas 4/5 shows that the database contains more recently added streets. However, some addresses aren't "parsed" with address abbreviations in mind. i.e., Hunter's Knoll is listed as Hunter's Knls on the map, and the correct name won't locate the address. A non-existent house number will also result in a "not found" for the street. This problem can usually be worked around if you know to look for it.

When using SkyMap with the PCMCIA GPS module, you may select displays with "heading up" or "north up". A system option will automatically center your current location on the map. The "auto centering" turns off when the map is moved manually. A GPS information panel optionally shows the Svs in view and the current lock status. The heading display shows only eight unique directions.

See: ETAK SkyMap GPS/Moving Map Display System -Review

3) Software for Sailors by Kees Rijniersce: GarTrack, a program for performance analysis for regatta sailors using data from a GarminGPS. GarTrack uses the data stored in the GPS tracklog-file during the race. Diagrams and tables provide insight in the relations between boat speed, wind speed and direction. If interested look at the pointer above.

Commentary:

Some map programs have serious limitations: Street Atlas 5 has been greatly improved over SA4, but still cannot download routes from the Garmins with LINES drawn between routepoints. SA4/5 can show real time GPS tracks, but erase the track plot when the map re-centers. SA4/5, ETAK, and PM3 use a heading marker with only eight unique directions.

Vista can display continuous real time tracks, but can't download tracks, routes, or waypoints. PM3 insist on drawing lines between unrelated tracks downloaded from the Garmins.

The Garmin G-III cannot simulate moving to a keyed-in position, although all other Garmins have this feature, making the unit not usable for evaluating map software function and accuracy. The Street Pilot cannot do

point-to-point routing without outside help and is limited to 100 way points.

For the record:

Joe, W2JO, has most operational experience with the Magellan GPS 3000, GPS 4000, DLX 10, Garmin MAP 175, and the Street Pilot. Jack, N4TEB, is more experienced with the Garmin 45, Eagle Explorer Ver. 1.4, Eagle Expedition II, and the interface software. Both have worked with the Garmin 12XL, Garmin G-II+, and G-III.

We have personally evaluated, to the best of our ability, all of the hardware and software mentioned, except as noted, and have no connection, financial or otherwise, to any of the manufacturers of the above hardware or software.

If you have any comments, additions/corrections, or to request a review of your PC mapping software or hardware, please let us know via Email below or by fax: (770) 886-1767, (404) 255-5804.

Joe Mehaffey: W2JO

Jack Yeazel: N4TEB

Thanks, and good navigating!

READER FEEDBACK

Allow Me to Intro Myself, Dan Johnson-kc2dhf-Islip L.I. I'm retired from Con Edison 12/97-volly F.f. & P/t Dispatcher Islip Fd. Reby Kc2ayc & Lima---member of L.i.m.a.r.c. Where I Got My Ticket from their weekend class 4/98.

Equip= Yaesu Ft50 & Icom 207h & Bc895tt & Regency Hx1500. Monitor Fdny-nypd-suffolk County Fd,pd & Ems-fdny*ems Et.al. I Down/printed Your Newsletter & Am Impressed.

Best Regards,

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The Urban DX'er would like to thank all those who contributed to this months issue!

Charlie - N2NOV, "R", Morris Torf, KB2PGE, Eddie Muro, KC2AYC, Ryan Holly, Bill. KE4IDU,