# Murphy hops a ride or can I (you) fly the PC-12 without some of our "goodies". By John Morris

On a late November flight out of Central Florida to the heart of Texas I discover that the RDR 2000 has decided to take the remainder of this mission, and the rest of its life apparently, off. Not a problem, since the pre-flight weather brief indicated a mostly clear, uneventful flight westbound plus I had the Nexrad/Metars information on the MFD. At least, I thought I did until after pushing lots of buttons I discovered that the previous owner had canceled the service without informing yours truly. So Murphy is on board.

The next day, a Friday, I was to head to Bermuda Dunes - Palm Springs, CA to pick up a passenger and return to Texas the following day. Friday morning was spent trying to find a replacement RDR 2000. If successful in locating one within 4 states that could replace the unit by the end of day, I was there and would proceed to California the next day. NOT! I can feel Murphy chuckling. At least I was able to renew the XM service for the aircraft.

Oh, did I mention the weather forecast for Palm Springs? Just about the only weather in the country was going to be along my route of flight with the first significant Low of the young winter season developing, of all places, to the south-*southwest* of Palm Springs traveling northeast, eventually crossing the entire country (see snapshot of day). Since I spent the entire morning trying to find a replacement RDR unit I would be not be departing until around 1:30pm (CDT). Even at this late date of the year flying along the southern part of the US, in the afternoon, you have to expect the possibility of build-ups and isolated T-Storms. Normally, the rainfall in southern California is minimal for this time of year, but the forecast called for the possibility of heavy rain showers throughout the entire southern California region. At least this was not a "tight" low, meaning the low levels winds were not going to be a big factor and there was not a great expectation for T-storms. Yeah, right (I think Murphy just booked an aisle seat-second row).

Westbound I "fired" up the Nexrad/Metars to monitor the weather along my route and destination. I am observing the sit map (MFD) for my trip when the Nexrad display completely clears. What the? About 5 minutes later the display returns, indicates for about 1.5 – 2 minutes, and then completely clears again! Murphy just moved to the aft facing seats. This would continue for the remainder of this flight and the next until I figured it out. Of course since I am heading westbound I have about a 45kt headwind so my planned time is just over 4 hours, which means I will be arriving at Palm Springs around 4:30pm (PDT). Also, since I was without my on-board radar I stayed in the clear as much as I could and wouldn't you know it, the cloud cover and occasional light turbulence had me climbing to FL280 and staying IMC for most of the enroute until beginning the STAR into Palm Springs.

The good news is that the Nexrad / Metars did work as an informational tool, long range tactical, like it should so I was able to see that the weather was somewhat deteriorating, meaning the rain was more frequent and as expected due to the time of day, starting to get heavier as I started the arrival. Still no signs of T-storm's, and the winds at the surface were around 10mph. Also, ATC was not reporting anything unusual towards the west and no complaints from the

other drivers on frequency. The kind-of bad news is that now I am descending into a sea level airport surrounded by some nice, mid-size mountains. Desert airport, last day of November, what's up with this?

The STAR issued – SBONO ONE –DECAS transition, was nothing new (see plate). As I was descending to 11000' I broke out for about 8000', long enough to see the very gray, heavy cloud up ahead. Been there. So again, I review the Nexrad (when it displayed). Since this area is also a major corridor for inbounds to all of the major Southern California airports, asking to remain clear at a higher altitude is not going to happen. Passing 12000' for 11000' I was back in the soup.

Approaching DECAS, I was handed of to SoCal approach. Part of the reason I elected to fly this mission was that when I arrived in the terminal area I would have some help with the weather picture since all (most?) of the approach radar sites are tied into the Nexrad system. Once I checked in, and when there was a break on freq. (busy area), I asked about maybe proceeding towards the Thermal VOR, about 10 miles east-southeast of my destination, to wait out a large, heavy rain (red) area that had showed on the MFD (the last display-update) over Dunes. The response was not what I had expected, but Murphy was asking to hop in the right seat. The controller said she has no weather display for this area. Swell.

Why no [weather] radar? I will answer in the analysis. I'm busy right now! So it's back to the really good old days! In the soup, over the mountains, scattered-heavy rain showers and besides vectors, the eyes have it. As I am approaching CLOWD, the MFD shows a large heavy (red) rain area over Thermal, just before the controller asks if I want to proceed to Thermal as requested. The previous red area from over Dunes is now possibly approaching CLOWD, and Dunes is still questionable. I am almost to the point of considering leaving the scene, except that I am in an area that you do not *just* leave. And again, no T-storms and significant winds reported. Not crazy about holding in possible heavy rain, but have several options for that as well - CLOWD, PSP, or the IAF - BIRGE. But really, Murphy does not get to come up and play. From listening to ATC and traffic, pre-brief of the weather systems/patterns, and some help (not needed) from the MFD [Terrain-EGPWS] I still have options. Fuel, ATC help and in this case as I was arriving at SBONO, about 15nm NE of Dunes, an inbound Learjet to Palm Springs Intl reported visual with Dunes at 2500' (he was listening and helped out), so the controller cleared me direct to Dunes airport, and approved lower altitude nearer to Dunes because of terrain (in contact with terminal radar until 1500' but no weather support). Made contact with the airport about 2 miles and 2000' in light rain, landing uneventful. Next day, of course, was sunny, windy and cool. Note: The area received about 1/3 of their annual rainfall that afternoon and evening. It caused some local flooding.

## Analysis of this flight:

**Should I have gone?** As a long time Instrument Instructor I have always told students that the best IFR pilot is the one that chooses to wait when in doubt. No flight is *THAT* important. I will not risk my life just because I am alone so any passengers on board should not make a difference but I will always discuss what's ahead and if any concerns, cancel. For this flight the

lack of the onboard radar, to me, was not a no-go decision based on the weather pre-brief (personal and professional) and my comfort with and knowledge of the capabilities of the PC-12. Weather Avoidance equipment is not an FAR issue in this case since the operation is Part 91 and not an MEL/MMEL requirement.

**Nexrad not working correctly, should I abort?** Datalink is a great tool. Having the Nexrad/Metars is very helpful. However, the Nexrad system, not the service providers, takes at least 4.5-5 minutes when the weather area intensifies, otherwise up to 10 minutes to send out a new display from its sites, then the time it takes to link to the MFD is the up to providers system and the time displayed on the MFD is from the provider, not the Nexrad system. That means that the "picture" we receive in the aircraft is several minutes old. The system has almost 100% coverage of the United States at 10,000' Not very useful (and should not be considered that reliable) when you get up close and personal i.e. the Terminal Approach environment. I was receiving updates every 5 minutes so the system was in fact functioning; it just would not hold the picture for very long. Also, since I was descending into a "hole" inside a mountainous region the Nexrad information was not going to be that accurate at lower levels due to the mountains and radar site locations. I never intended, or expected, to use the MFD as my primary means of weather avoidance once I was in the descent/terminal phase of the flight.

**Why no weather radar support in the Terminal Approach area?** ATC controllers 1st priority is traffic separation and additional services are on a workload basis. I incorrectly assumed that the approach controller would provide weather services. That is because I reside out of Central Florida and I have to admit to being spoiled by some additional radar services available in my home area. That service is the TDWR (Terminal Doppler Weather Radar), which is available at 45 major airports across the US (see map). As the name implies, this system is tied to the terminal area of that airport, takes a much greater slice of the immediate weather and supplies updates to the controllers every *minute*. From personal experiences I can attest to their "seeing" weather (gaps) that I cannot pick-up with the onboard radar. Of course we still have to use our judgment before committing to any recommendations, but this greatly helps. Note: If you attended the POPA conference you would have heard Bruce Landsberg, AOPA Air Safety Foundation, speak about the on-line courses at www.asf.org. This is where I got some of this info. Weather or not you attended (pun intended) you should visit this site for this and other info related to air safety.

**What other options were available?** 1st: Fuel. Having the ability to divert 2 plus hours away is a major pre-requisite before committing to this type of flight, with or without the RDR. 2nd: Even though it turned out that I was not to receive any weather radar support from the terminal controller, I still have the controller's knowledge of the environment based on Pireps since the three airports are in the valley and most of the traffic is going to Palm Springs Intl via basically over-flying the other two airports on their approach. Notice that the controller did not set me up for the RNAV 28 initially but had me fly the entire arrival to SBONO intersection. That implies some possible local knowledge about current weather conditions more favorable to my destination. Dunes, by the way, has no weather reporting, but Jacqueline Cochran Regional (TRM-Thermal VOR) 9SE and Palm Springs Intl (PSP) 15NW do. 3rd: The PC-12. If I have to drive through some rain, maybe heavy, I am in a very good platform. Use the autopilot-no

altitude hold, keep the airspeed below Vo, and Open the Separator, Ignition-ON and watch for altitude deviations-*DOWN*. I am IFR but if I have an altitude excursion, let it ride if up, but over the mountains and maybe only two thousand feet above (see CLOWD and SBONO), down is not good. But again, the weather reports were in my favor as to having severe downdrafts/updrafts, but take nothing for granted! ATC will see the altitude excursions.

1.Question: When did the Nexrad system become fully operational in the U.S.?
2.Question: When did Datalink become available?
3.Question: Before Datalink, how did we receive en-route and arrival weather?
4.Question: On the SBONO ONE ARRIVAL, inside the red highlighted box, what are the Meanings for MAA FL450, 11000 and*5600?
Answers will be posted in the back of this issue.

" A Safe Pilot is Always Learning"

John Morris
ACFT Services
www.acftservices.com

Thermal Weather for Nov 30-2007

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3:52 PM | **53.1** °F / **11.7** °C | **48.0** °F / **8.9** °C | 83% | **29.70** in / **1005.6** hPa | **10.0** miles / **16.1** kilometers | NW | **6.9** mph / **11.1** km/h / **3.1** m/s | **0.08** in / **0.2** cm | Rain | Light Rain |
| METAR KTRM 302352Z AUTO 32006KT 10SM -RA SCT031 OVC048 12/09 A2970 RMK AO2 SLP056 P0008 60012 T01170089 10139 20117 56022 TSNO | | | | | | | | | | |
| 4:52 PM | **51.1** °F / **10.6** °C | **46.0** °F / **7.8** °C | 83% | **29.70** in / **1005.6** hPa | **2.5** miles / **4.0** kilometers | NW | **8.1** mph / **13.0** km/h / **3.6** m/s | **0.08** in / **0.2** cm | Rain | Heavy Rain |
| METAR KTRM 010052Z AUTO 32007KT 2 1/2SM +RA FEW014 OVC038 11/08 A2969 RMK AO2 SLP056 P0008 T01060078 TSNO | | | | | | | | | | |
| 5:03 PM | **50.0** °F / **10.0** °C | **46.4** °F / **8.0** °C | 87% | **29.69** in / **1005.3** hPa | **1.5** miles / **2.4** kilometers | NNW | **5.8** mph / **9.3** km/h / **2.6** m/s | **0.10** in / **0.3** cm | Rain | Heavy Rain |

Palm Springs Nov 30-2007

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|---|---|---|---|---|---|---|---|---|---|
| 3:53 PM | **50.0** °F / **10.0** °C | **46.0** °F / **7.8** °C | 86% | **29.73** in / **1006.7** hPa | **3.0** miles / **4.8** kilometers | SSW | **4.6** mph / **7.4** km/h / **2.1** m/s | **0.10** in / **0.3** cm | Rain | Light Rain |
| METAR KPSP 302353Z 20004KT 3SM -RA BR OVC042 10/08 A2973 RMK AO2 SLP067 P0010 60030 T01000078 10117 20100 56016 | | | | | | | | | | |
| 4:09 PM | **48.2** °F / **9.0** °C | **44.6** °F / **7.0** °C | 87% | **29.71** in / **1006.0** hPa | **1.5** miles / **2.4** kilometers | Calm | Calm | **0.10** in / **0.3** cm | Rain | Light Rain |
| SPECI KPSP 010009Z 00000KT 1 1/2SM -RA BR BKN023 OVC040 09/07 A2971 RMK AO2 P0010 | | | | | | | | | | |
| 4:16 PM | **48.2** °F / **9.0** °C | **44.6** °F / **7.0** °C | 87% | **29.72** in / **1006.3** hPa | **2.0** miles / **3.2** kilometers | WSW | **4.6** mph / **7.4** km/h / **2.1** m/s | **0.12** in / **0.3** cm | Rain | Light Rain |
| SPECI KPSP 010016Z 25004KT 2SM -RA BR SCT023 BKN040 OVC050 09/07 A2972 RMK AO2 P0012 | | | | | | | | | | |
| 4:26 PM | **48.2** °F / **9.0** °C | **44.6** °F / **7.0** °C | 87% | **29.71** in / **1006.0** hPa | **5.0** miles / **8.0** kilometers | Calm | Calm | **0.12** in / **0.3** cm | Rain | Light Rain |
| SPECI KPSP 010026Z 00000KT 5SM -RA BR SCT023 BKN050 OVC090 09/07 A2971 RMK AO2 P0012 | | | | | | | | | | |
| 5:32 PM | **48.2** °F / **9.0** °C | **46.4** °F / **8.0** °C | 93% | **29.65** in / **1003.9** hPa | **2.5** miles / **4.0** kilometers | Calm | Calm | **0.07** in / **0.2** cm | Rain | Light Rain |

PALM SPRINGS, CALIFORNIA

AL-5848 (FAA)

# RNAV (GPS) RWY 28

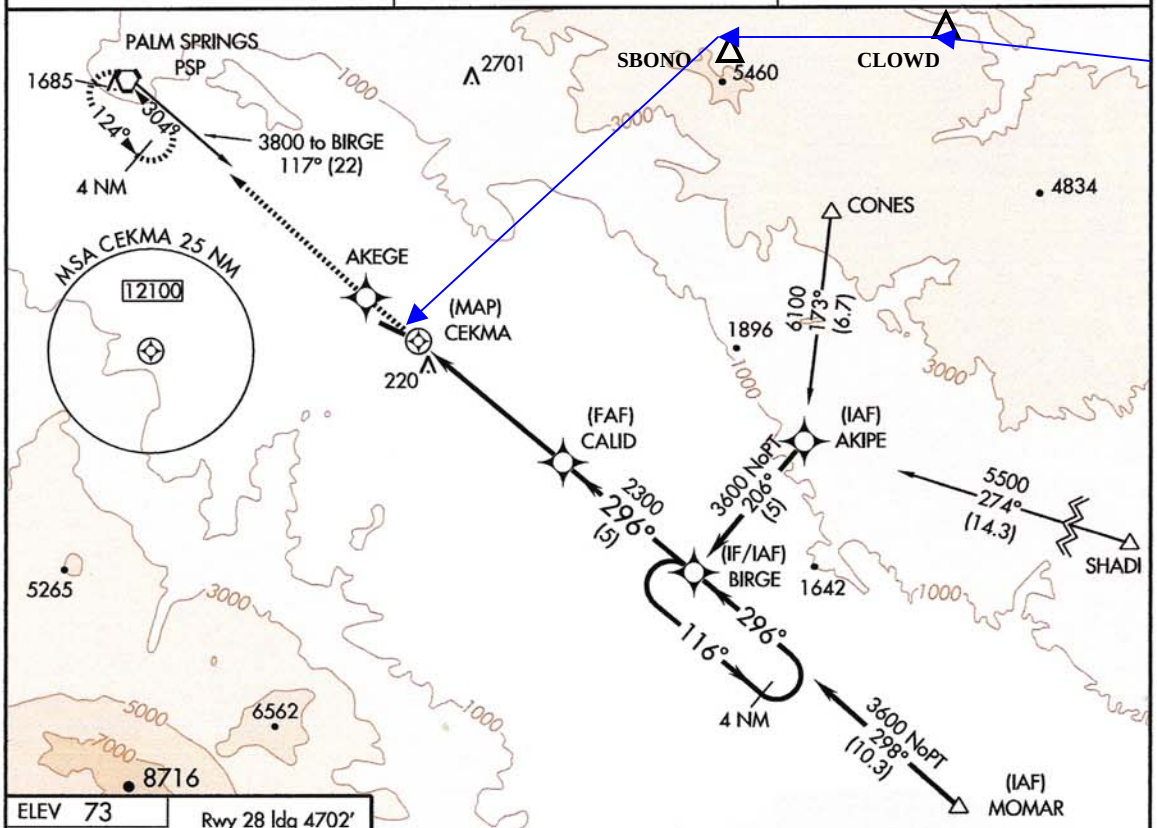
PALM SPRINGS/BERMUDA DUNES (UDD)

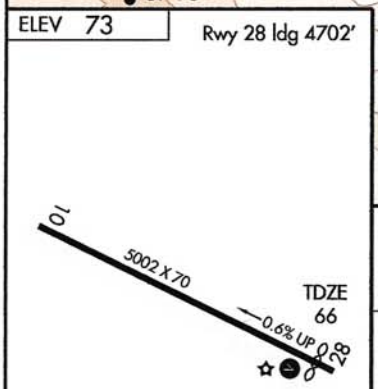
| APP CRS | Rwy Idg | 4702 |
|---|---|---|
| 296° | TDZE | 66 |
| | Apt Elev | 73 |

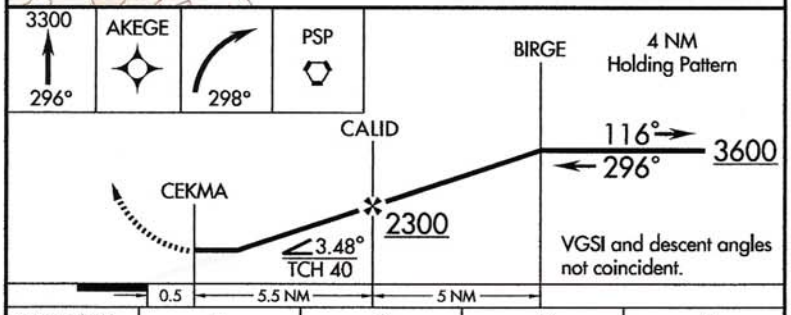
GPS or RNP-0.3 required. DME/DME RNP-0.3 NA. Use Jacqueline Cochran Rgnl altimeter setting.

MISSED APPROACH: Climb to 3300 via course 296° to AKEGE WP then right turn via course 298° to PSP VORTAC and hold.

| JACQUELINE COCHRAN REGIONAL ASOS | SOCAL APP CON ★ | UNICOM |
|---|---|---|
| 118.325 | 135.275 251.1 | 122.8 (CTAF) |



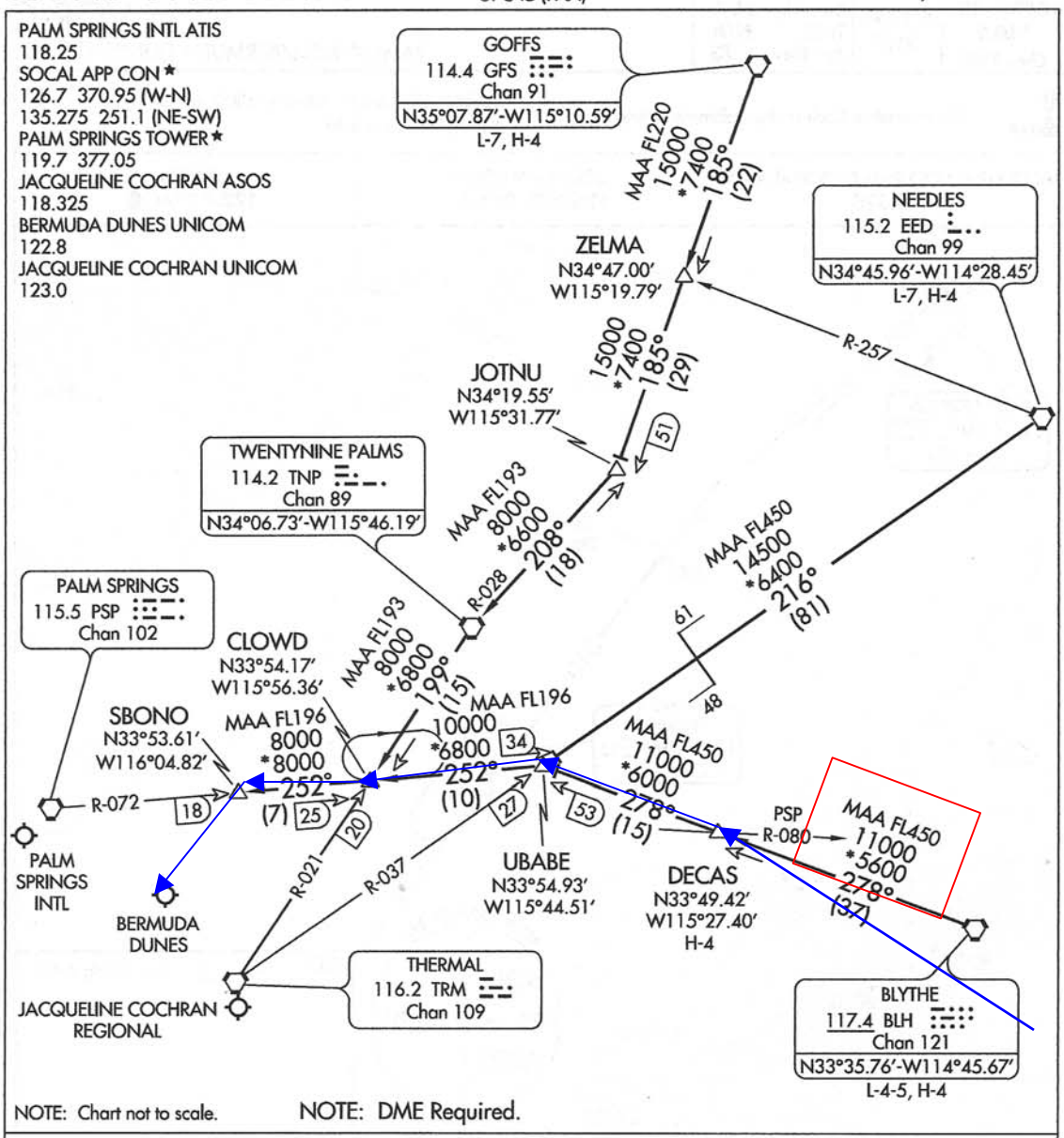

| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| LNAV MDA | 1020-1¼ 954 (1000-1¼) | 1020-1½ 954 (1000-1½) | 1020-3 954 (1000-3) | NA |
| CIRCLING | 1020-1¼ 947 (1000-1¼) | 1020-1½ 947 (1000-1½) | 1020-3 947 (1000-3) | NA |

(SBONO.SBONO1) 07298

# SBONO ONE ARRIVAL

ST-545 (FAA)

PALM SPRINGS, CALIFORNIA




BLYTHE TRANSITION (BLH.SBONO1): From over BLH VORTAC via BLH R-278 and PSP R-072 to SBONO DME. Thence....

DECAS TRANSITION (DECAS.SBONO1): From over DECAS INT via BLH R-278 and PSP R-072 to SBONO DME. Thence....

GOFFS TRANSITION (GFS.SBONO1): From over GFS VORTAC via GFS R-185 and TNP R-028 to TNP VORTAC, then via TNP R-199 and PSP R-072 to SBONO DME. Thence....

NEEDLES TRANSITION (EED.SBONO1): From over EED VORTAC via EED R-216 and TRM R-037 to UBABE DME, then via PSP R-072 to SBONO DME. Thence....

....From over SBONO DME expect radar vectors to final approach course.

SBONO ONE ARRIVAL

PALM SPRINGS, CALIFORNIA

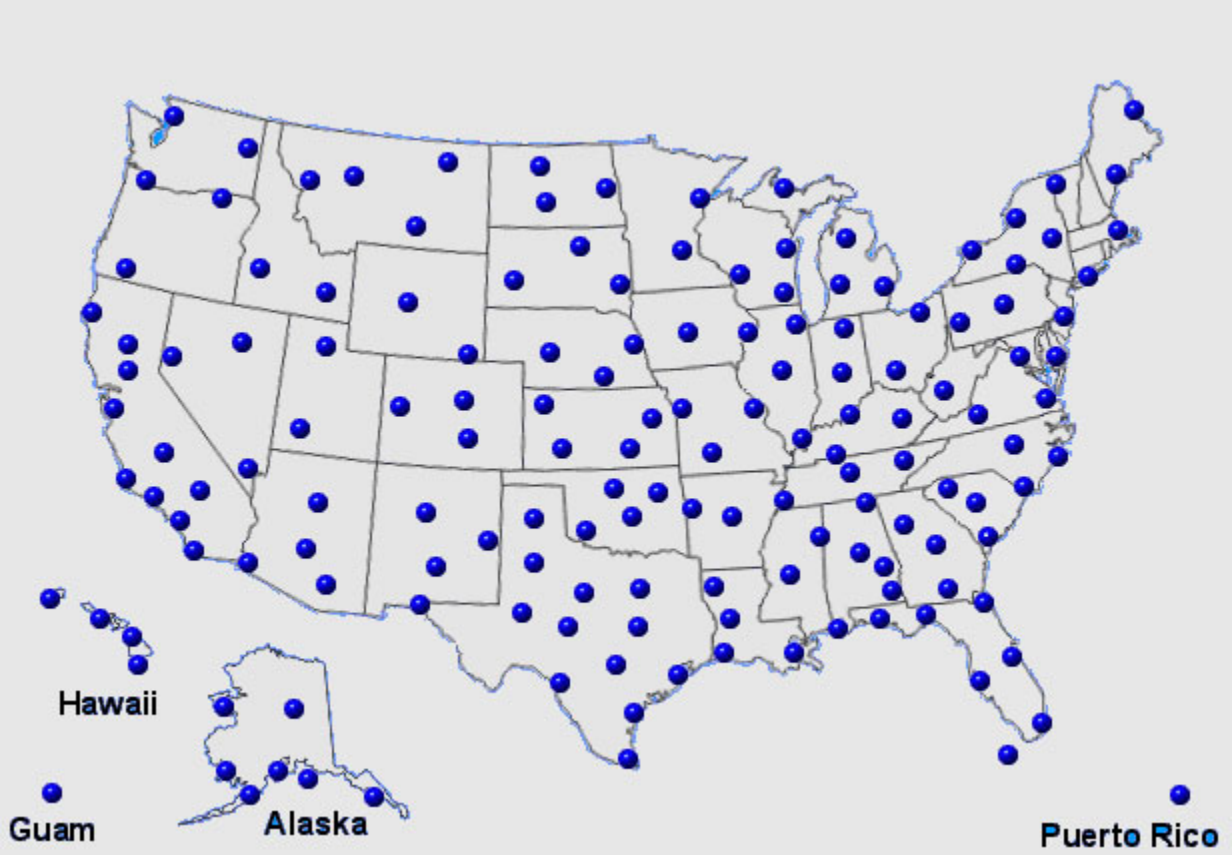
(SBONO.SBONO1) 07298

**Base reflectivity images** come from scans of the lowest NEXRAD antenna tilt angles—usually the 0.5-degree tilt angle. This scan only shows precipitation in the lowest layers of the atmosphere, since the radar beam at that angle reaches approximately 10,000 feet at a range of 90 nm from the radar site, and 16,000 feet at 143 nm from the radar site—the maximum range for base reflectivity. Radar echoes beyond 143 nm probably won't show up on base reflectivity scans from a single site, so that imagery may be derived from either the long-range view (out to 248 nm from the site) or the overlap from neighboring NEXRADs.

**Composite reflectivity images** are made up of the highest-level radar returns from all antenna scan angles. This gives you a look at much more of the vertical cross section of the atmosphere, and it is useful for examining developing thunderstorms. In their formative stages, strong thunderstorms begin by drawing water droplets and ice particles into the midlevels of the atmosphere. While updrafts prevail, all this moisture is retained at altitude—say, 20,000 to 30,000 feet—until its weight can no longer be supported by vertical currents. Then rainfall and hail at the surface begin.

These six levels were established by the National Weather Service and are based on measurements from the Video Integrator and Processor, or VIP. VIP contours radar reflectivity in dBZ.

## Nexrad Sites - USA



**TDWR Sites - US**

Answers to questions from "**Murphy hops a ride**":

1. 1st Operational WSR88D June 1992, Last Aug. 1997
2. FISDL – Flight Information System Data Link came on-line late 1999, Early 2000
3. EFAS- Enroute Flight Advisory Service aka Flight watch
4. MAA FL450 = Maximum Authorized Altitude

   11000 = MEA (Minimum Enroute Altitude)

   *5600 = Minimum Obstruction Clearance Altitude (MOCA)

**November 30, 2007 Texas to Bermuda Dunes, Palm Springs**