

On of many articles on hand-held radios in the cockpit.

This one was found at: <http://tinyurl.com/gtuxlmy>

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Handheld Problems

Many of the problems posed by handheld radios are really antenna limitations.

I am not surprised at the results from the various tests conducted in "Rescue Heroes?" [Instrument Check, March]. All of the shortcomings reported are exactly what an experienced communications technician would expect.

A handheld transceiver has very limited transmit power. Most of them use a different method of stating transmit power, stating peak envelope power rather than "carrier power" as used by panel mounted transmitters. That means there is approximately 1 watt of carrier for a hand-held rated at "5 watts" – a substantial reduction in transmit range compared to your No. 1 com.

Even more telling is the hand-held antenna system efficiency compared to a "real" antenna mounted on the airplane. Remember, a half wave antenna is about 42 inches long, so the hand-held antenna is shortened by inductive loading and your hand is used as the "ground plane" to make it possible to fit it into the cabin. The equivalent reduction in transmit power using a shortened antenna without a real ground plane and housed in a metal cabin is probably on the order of 90 percent. There isn't much left for communications in this case.

The fixes: Mount an antenna on the airplane – even an old bent whip on the belly – and enjoy a significant increase in range, maybe five times. Use a headset adapter and a headset, never the built-in mic and speaker.

The VOR receiver has reasonable capability with reasonable signal strengths, but weak signals cause errors in the VOR converter, causing varying bearing readouts. The mechanism for the error is the automatic gain control in the receiver.

With reasonable signal levels at the antenna connector, say 25 microvolts, the bearings will be quite good, but below that level the receiver is struggling to get a good input to the converter, causing the jitter.

VOR reception is further hindered by the fact that the handheld's antenna is not particularly good at VOR frequencies, so there is even less signal than for the com frequencies.

But much worse for VOR is the orientation. VOR signals are horizontally polarized, so holding the radio "upright" means the antenna (such as it is) is vertically polarized. Typical signal strength loss for cross polarization is 20dB, meaning that a 100 watt transmitter looks like it is running at 1 watt. At least 90 percent of the signal is lost, plus the vertical component of the transmitted VOR is fraught with error, causing spurious reflections.

The fix is to install a splitter for the VOR/LOC aircraft antenna with an extra port and run a cable to the panel with a connector for use by the handheld when navigating with the VOR.

Be aware, however, that you'll have to switch from the VOR/LOC antenna to the com antenna if you want to use the transceiver. Transmitting into the VOR/LOC splitter will result in a very small signal reaching the antenna – that's the function of the splitter design.

-R. G. Copeland

Via e-mail

Your points on external antenna considerations are well-taken, and in retrospect we should have addressed that concern in the original article. We are frequently contacted by pilots who have somehow concluded that their airplane will fall out of the sky if they don't spend a small fortune on a handheld radio and GPS, and this article was meant as a reality check.

The main goal, however, was to instill a sense of reality in the expectations pilots have when they purchase these things for backup use. This is especially true of renters, who don't have the option of external antennae, and student pilots, who often fall victim to the marketing machine that insists they fill their flight bags with equipment pitched as essential devices to stave off disaster.

No Wonder It Didn't Work

I find it refreshing that I am not the only pilot that will persist in using an instrument despite the warnings the indicator is giving me, as evidenced by your use of a handheld displaying a "low battery" warning [Instrument Check, March]. The solution to this problem is to have a separate alkaline battery pack available with fresh batteries.

Secondly, if you didn't know, ICOM makes a device that fits in the antenna line between one of your radios and its antenna. When it is attached to the handheld radio and plugged in, it allows the handheld to use the outside antenna. It disconnects the stack radio at the same time to prevent interference. The range both ways is nothing short of excellent.

-Steve Goode

Via e-mail

We disagree that the low battery indication was responsible for the VOR troubles, as it illuminated halfway through our test and the handheld still had plenty of juice to receive signals. And as for the external antenna connection splitter, they are available from a number of sources. But as we mentioned above, there are lots of pilots who can't make this modification to the airplane they fly.

Backups Beyond GPS

Your article "Rescue Heroes?" [Instrument Check, March] may have been primarily GPS-oriented, but it brought up a night flying issue I've always been a bit confused about, namely CFM – cockpit flashlight management.

It seems people have occasional difficulty locating their mini-lights, holding them in their mouths, and otherwise getting the light to shine where it needs to be. In fact, it may be good that the com is out if you're trying to fly by flashlight, as it's unlikely anything you'd say would come through very well anyway.

There's a better way. I've seen headset mini-light holders around for years. But even more illuminating perhaps, and easily available, are the hiking/backpacker style headlights available at almost any well-stocked camping store these days.

Yes, it's another piece of gear. And yes, you'd add it to your head weight, which may already be pretty heavy given we're a bunch of pilots. However, these are not prohibitively expensive, they're fairly comfortable and they work for pre-flight as well as emergencies.

A pilot could put this on prior to starting up or just leave it in the bag. The one I have comes with a red lens option as well. I've not personally had an electrical failure, but I can tell you from experience this unit is workload reducing at night in any case.

-Scott Germaise

Via e-mail

CFM – just what we need is another acronym. Nevertheless, night flight creates its own set of hazards, which we'll elaborate on in the near future.

Way to Go/No-Go

I wanted to compliment you on the article contrasting go and no-go decisions [Weather Tactics, March] made by the two pilots flying on the same day in the same weather system. The go/no-go decision is the most critical one we make in flying, day in and day out. I've been making them for 25 years and I still learn from hearing how others make their decisions.

What made these articles so instructive was the level of detail of the risk analysis. This is truly how it works in the real world for experienced pilots.

I'd like to see more articles like these, perhaps even an ongoing series.

-Bob Thomason

Charlotte, N.C.

Did He Inhale?

In Pat Veillette's article "Just Say No" [Medical Matters, March], you state that among the effects of marijuana use "decreased reaction time." I would think that statement should read "increased reaction time" or "delayed reaction time," meaning that it would take longer, not shorter to respond to a stimulus when using marijuana.

-Tom Weiss
Flushing, N.Y.

We think you're right, but our crack copy editor is spending so much time at the snack machine we can't find out for sure right now.

Freezing in Ft. Myers

You cite a Dec. 6 Beech Baron accident in Fort Myers, Fla., in the Preliminary Reports section in March. In it, you state the weather conditions included "temperature 16 F and dewpoint 16 F." Is that right? Or is it supposed to be 16 C?

-Jay Anderson
Milwaukee, Wis.

The temperature and dewpoint information was taken from the NTSB report, which was obviously in error in this case. A check of weather archives found that 16 C is a much more reasonable number.

Brainless Cruisers

Robert Patlovany's letter "Head-On Doesn't Have to Be" [Unicom, February] brought to mind my pet peeve: those pilots who feel it's always appropriate to cruise VFR at 3000' msl.

As a charter pilot in the Chesapeake Bay area, I frequent the coastal airfields of NJ, MD, VA, and NC, nearly always under ATC control. Recently I was flying IFR in clear weather approaching my landing airfield. ATC cleared me to 3,000 feet. Jumpin' Jeosphat! Suddenly a westbound VFR single appeared at my altitude. Thankfully, it only took a 2 g pull up to avoid the airplane this time.

Why do so many pilots always fly at 3,000 feet, regardless of whether they're flying north, south, west or east, no matter what the weather? I know, VFR cruising rules don't apply unless you are operating above 3,000 feet, which really helps you maintain cloud clearances when clouds exist below 4,000 ft. But on a clear day, why not 2,700 feet? How much protection against the dreaded engine failure do you lose?

This situation happens to me pretty often, although I can usually avoid the 2 g maneuver with increased visual vigilance. What I haven't tried yet is turning down the 3,000-foot assignment from ATC.

Although Robert's solution may not be optimal for all, in my opinion it's sure better than the 3,000-foot danger zone that has been manufactured by the FARs in league with the brainless 3,000-foot cruisers.

Any suggestions?

-Bruce Sheppard
Easton, Md.

We agree that many pilots appear to use Big Sky Theory as their main collision avoidance tool when outside the traffic pattern. While many pilots try to stick to cardinal altitudes during low-altitude VFR flights, we try to hedge our bets as you suggest, picking something like 1,700, 2,300 or 2,700 feet as a better alternative.

The View From Above

Hats off to Chip Wright's article, "Slanted View" [Weather Tactics, January], about the dangers of flying in haze with low slant-range visibility. As a VFR-only pilot who flies in the Southern Appalachians of eastern Tennessee, I am very familiar with the hazards of the hazy, "milk-bottle" sky that seems especially prevalent here in the summertime. Consequently, I've developed my own set of personal minimums, and generally avoid flying with a so-called visibility of "5 miles and haze."

Sometimes, to get a bird's-eye view of hazy sky conditions, I'll take off at my nontowered airport, climb to pattern altitude, and "run around the patch." If I don't like what I see from the perch, I'll just stay in the pattern and shoot some landings. It's a safe way to spend the afternoon – and good practice to boot.

-Philip J. Jacobs
Pioneer, Tenn.

There's no doubt this is a safely conservative choice. The problems tend to arise during cross-country flights into the growing haze often caused by rising afternoon temperatures.

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