

APRS in Aircraft

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Around 2000 I became involved in missionary work in Mozambique. I was asked to advise a particular missionary on how he could maintain contact with his home while travelling around the area that was allocated to him. We started off with CB radio because it was the simplest, but his area had a radius of about 500km so CB was only useful over shorter distances. He did however become known to CB'ers in the RSA as "Danie from Mozambique" every time, in CB language, "the skips were running"!

Eventually it was decided to equip more mission stations with HF radio and to licence these radios on commercial frequencies. We obtained Kenwood TRC80 radios and commercial wide band antennas. An immediate effect of the communications was that the mothers relaxed because they could talk to doctors on other mission stations when their children became ill.

There was soon a need to use the long distance capabilities of the radios to communicate across international borders but the commercial licences did not allow this. Amateur radio was the only possibility, and missionaries started to qualify as radio amateurs. Eventually about thirty-five obtained amateur licences, increasing the amateur population of Mozambique substantially. Digital communications was used, at first AEA PK232 modems were used and later replaced with SCS modems using Pactor. A radio BBS was set up in the South Africa for these stations to communicate with.

When the first radios had been bought, a friend who had a pilot's licence suggested to me that we travel to Mozambique by plane to install the first five radios. This is a story for some other time but I learnt a few things about travelling in an African country like Mozambique by small plane. It appeared that there were a few organizations that did flying for missionaries, like Mission Aviation Fellowship, MAF, Mercy Air, and others. These are the famous bush pilots, people who know how to take off and land on small air strips in the bush. One pilot told me that he had six thousand landings in his log book. He was also a qualified aircraft mechanic, and was also qualified as a pastor.

When you take off from Maputo, or Beira, or Quelimane, you soon lose contact with the ground stations using VHF radio and you are on your own. I flew again with Mercy Air and their planes had HF radios, and one of the pilot's wives used to sit with an HF radio at the base in White River and the pilot would report, using SSB, every time he took off, every half hour in the air, and whenever he landed. This was their own version of air traffic control.

And then I read in QST magazine about APRS and the interface designed by Byron Garrabrant, N6BG, which he called Tinytrak, to do Automatic Packet Reporting on VHF. Garrabrant's intention was for APRS to be used as a short messaging system, but it soon became known as a position reporting system. I made a board, installed the components, connected it to a GPS and was playing with it on 2M. And then it became obvious that APRS would be able to help track Mercy

Air's planes because they already had the HF radios and the GPS, all they would need is the Tinytrak interface. VHF APRS works at 1200 baud and on HF only 300 baud operation is permitted. So I wrote to Byon and asked him if he would modify his Tinytrak to work on HF as well. I don't remember his exact answer, but it said "no". For a while I did nothing but eventually I wrote to him again saying more or less this: "You live in America where you have excellent infrastructure, but I live in Africa where our pilots have to fly into the bush without the air traffic control that you have". I do not know if this helped, but some time after this, Byon made available Tinytrak 3 that could work on HF and VHF.

The advantage of APRS over voice communications is that APRS transmissions are very short, only a second or so, and could be inserted in a voice channel without much disruption. They could occur every minute instead of the half hour used for voice transmissions. They also seem to get through better than voice signals. On the receive side, a program like UI-View has the capability of recording signals, and playing them back later so that an aircraft's track could be recorded. In the case of an aircraft going missing, the search area would be reduced considerably.

Unfortunately I never had the opportunity to demonstrate this facility to Mercy Air or any other organization. If all small aircraft in Southern African countries had HF APRS fitted, there would probably be several amateurs who would be willing to track them and forward the data to a central website like APRS.fi where most amateur APRS signals end up. With several monitoring stations in Southern Africa, difficulties with propagation could be minimized and a quality service provided.

I watched the series called "Flying Wild Alaska" on TV with interest. The bush pilots impressed me tremendously, they really knew how to cope with snow and ice and strong winds and tiny airstrips, and sometimes no airstrips at all. And still they showed numerous wrecks of aircraft on the ground. It was interesting also that the American government issues ALL people who go hunting or hiking or fishing into the wilds of Alaska, with small radio beacons that they could switch on when they were in difficulties. We need to do something similar here.