Flight Tracking & Messaging Systems (FTMS)

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Introduction

Outside radar range, small planes flying in remote locations must be tracked by alternative means. Organizations aimed at emergency relief, humanitarian development and missionary support follow such flights, to insure safety. The Automatic Flight Following System (AFFS) has been extensively tested by JAARS for this purpose, but its central microcontroller--a small single board computer (SBC) has become obsolete. The FTMS team has been upgrading AFFS to version 2.0 by replacing the SBC with a newer one still on the market. This includes updating, and compiling code for the newest Rabbitt SBC, establishing communication between the Pactor modem (modem on the pilot-side) , and establishing communication between the Pactor modem and a ground modem. (Rabbitt SBC located by the blue arrow shown in the picture to the right)

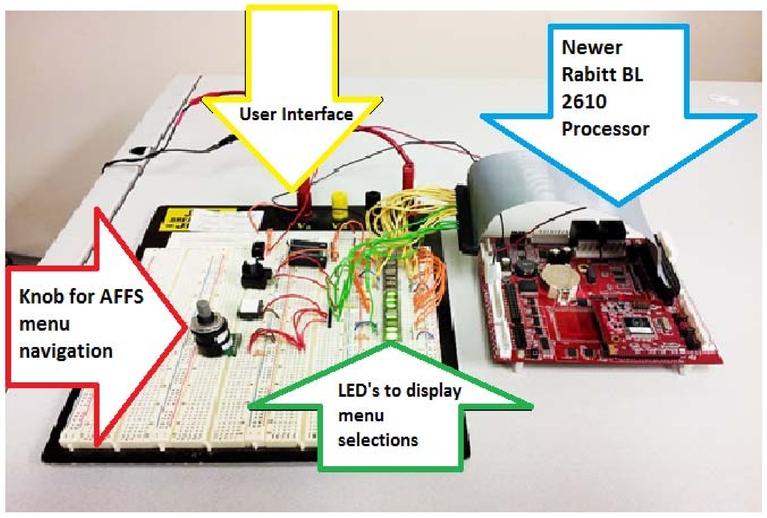
Clients

JAARS and/or other organizations flying small planes into remote locations for:

Emergency relief, Humanitarian development & Missionary support

Test Results:

This past year, the team has been testing how well the newly ported (Dynamic C) code works for the AFFS system by interfacing the SBC with the PACTOR modem (that converts between text messages and radiowaves). The pilot-side PACTOR modem sends flight information to the ground-based PACTOR modem counterpart, which is interfaced with AFFSWin - a computer program that automatically logs and displays the information for tracking by a flight monitor.



Here the new AFFS 2.0 prototype is connected on the bread board (yellow arrow indicating) , while AFFS 1.0 connected serially to the airplane modem. This airplane modem is connected with a signal cable to another modem representing a ground station.

Further Information

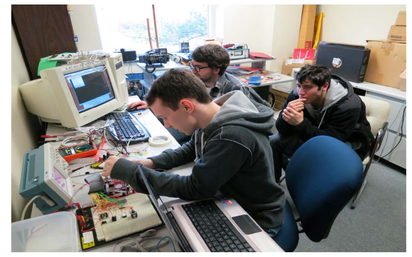
Find out more about our project on the collaborator wiki!

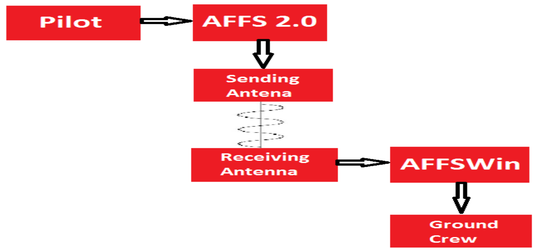
http://www.thecollaboratoryonline.org/wiki/Flight_Tracking_%26_Messaging_Systems_%28FTMS%29

Results

For test purposes, the team has successfully sent data from the SBC to its Pactor modem (pilot-side), established a link between the pilot side modem and a second modem representing the ground-based monitor, and parsed the data into AFFSWin which receives and logs tracking information. The team also began interfacing the SBC with the GPS unit through a serial connection, and is working to establish a successful link between them.

Here, we are working on interfacing AFFS2.0 with the ground station computer running AFFSWin through serial communication.





Conclusions

FTMS has taken significant steps toward a new version of AFFS, to enhance the safety of pilots flying small planes in remote locations. AFFS 2.0 now successfully connects with AFFSWin to receive and confirm some information a ground-based monitor would need to track the flight. Future work will complete the design, extend the testing and integrate other comm modes.

Acknowledgements

Carman Frith, Avionics Specialist, JAARs; Cary Cupka, Avionics Consultant
Joel Love, senior project leader; Brianna Wenger, junior team member

Messiah College · Department of Engineering · the Collaboratory for strategic partnerships and applied research