

Advanced Copperfield

An ESM System Suitable for UAV Applications



Key Features

Pulse Measurement Performance:

- Pulse Width: 50 ns min, no effective maximum
- PRF/PRI: Instantaneous ~1.0 MHz, sustained rates ~ 10-20% duty cycle or more

Frequency Standard:

- GPS disciplined rubidium time standard

GPS Interface:

- Trimble Force 22 P(Y) SAASM Compliant

Workstation Type:

- Data Processing/Control Through Workstation Running "Finder" Software
- Compatible With Solaris or Linux Systems

RF Capability:

- Multiple IF receivers of either 100MHz BW @ 160 MHz cf or 500MHz BW @ 1GHz cf
- External tuners provide RF input from 500 MHz To 40 GHz Capability

Receiver Capability:

- Compatible with R300A MMIC receiver, Condor ALR-81/TN613
- Will generally be compatible with any receiver with RS-232/422 or IEEE802.3 Ethernet Interface

Special Pulse Processing and Cuing Capability:

- Any MRDIG module can cue internal or external auxiliary processing/receiver units

Direction Finding Capability:

- Cues External Interferometer
- Internal DF module available soon

AIS Capability:

- Dual band AIS receiver available. Other similar capabilities are possible, including communications

Environmental:

- Forced Air Cooling
- -100 To 20,000 Feet
- 0° To 50°C Operating

Advanced Copperfield, a modular ESM/ELINT for use in airborne UAVs, ground, and shipborne monitoring systems, detects, tracks, and identifies pulsed RF signals. System modularity allows installation of multiple IF channels in a common hardware infrastructure. A Front End receives RF signals at the antenna, and converts them into standard 1 GHz IF or 160 MHz IF. Tunable from 500 MHz to 40 GHz, each IF band on Advanced Copperfield provides an instantaneous bandwidth of 100 MHz (160 MHz IF) or 500 MHz (1 GHz IF).



Advanced Copperfield

Advanced Copperfield relies on proven Finder software operating on an embedded Linux based PC, and accommodates remote workstations. It has recently been upgraded to include support for receiving and decoding AIS messages for monitoring shipping traffic.

Advanced Copperfield, the next generation of Finder hardware, was developed by Aeronix, Inc. under contract to Naval Research Laboratory, and has been fielded in several flight experiments.

Advanced Copperfield is housed in an ATR chassis, containing a sub-rack of 3U cPCI 160mm cards (standard 32 Bit cPCI). The chassis also contains a standard AC or DC cPCI power supply, a two-slot combination SAASM GPS / Rubidium oscillator (Common Services Unit, or CSUT) to provide disciplined time and frequency references, and an Ethernet switch.

The heart of Advanced Copperfield is the Modular Integrated Receiver Digitizer or MIRDer module, a two slot 3U cPCI module containing a Digitizer/Processing baseboard (MrDIG) and a dual IF mezza-

nine card (MrIF). Available variants of the mezzanine card currently available include a 500MHz/100MHz IF version and an AIS/100MHz IF version. Multiple MIRDer modules can be installed in a single chassis.

The baseboard contains a large reprogrammable FPGA which implements the IF Receiver functions. By merely reprogramming the Digitizer card, a wide variety of different functions can be accommodated. AIS was the first of such new capabilities. precision DF, special pulse processing and extended bandwidth applications are also feasible.

The Advanced Copperfield communicates with the outside world via Ethernet (on UAVs, typically through an external CDL or TCDL link). Multiple serial ports and a set of customizable digital I/O signals are also available.

Advanced Copperfield™ SPECIFICATIONS	
Chassis	7.5" W x 10.1"H x 12.6"D, 25 lb (excluding front end/antennas)
Power	175 Watts, 47-440 Hz, 120VAC or 24-32 VDC, 28 V nominal
RF Capability	2 channels of 100 or 500 MHz BW per IF module Up to four cards/chassis
Frequency Range Capability	Any frequency range converted into 160 MHz or 1 GHz
Deployed System Capability	500 MHz – 40 GHz
DF, Pulse Processing Capability	Cues external/internal PDF, specialized pulse hardware, DF system in development
HW Internal Bus Configuration	32 bit CompactPCI compliant modules
External Control/Telemetry Interfaces	802.3 100 Mb Ethernet, high speed serial (232/422, HDLC), customizable digital I/O
Remote Link Capabilities	Fault and loss tolerant link allows control of payload over remote link
Client OS and Supporting SW	Solaris or Linux; Linux versions uses no proprietary software components



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