A HF ALE global gateway.

The HF Cellular Network is a state-of-the-art advanced HF ALE network designed to pool HF ALE ground assets that will essentially provide an umbrella-like coverage over an extended geographical area. The HF Cellular Network is impervious to traditional point-to-point propagation limitations (time of day, ionospheric fluctuations, sunspot, inospheric perturbations, frequency selection, etc.) and provides exceptional reliability and connectivity performance over traditional ALE networks. The system concept is very similar to that of the "cellular" phone system in that a cell phone will continually provide the best tower to communicate over. Similarly, HF Cellular provides the best ALE ground station to the mobile user.

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HF CELLULAR NETWORK OVERVIEW

The HF Cellular concept, shown in abbreviated form, is very similar to the "cellular" phone or mobile phone concept. In a cellular telephone network, a mobile user initiates a call and the closest (or best-receiving) base station completes the call. In HF Cellular, all of the radio sites within an HF network are set to scan the available frequencies (or channels) in Automatic Link Establishment (ALE) mode, waiting for a mobile platform to initiate an ALE call. All radio sites that hear a call, stop scanning, "listen" to the call and perform a link quality analysis (LQA) measurement. In traditional point-to-point HF links, a specific radio site would respond to the ALE call. In the HF Cellular architecture, rather than any one radio site answering the ALE call, each radio site reports its LQA measurement back to a central HF Cellular server. The server determines which radio site has the best LQA and directs that radio site to complete the ALE link with the mobile platform. In this way, no matter where the platform is located, the best propagating link (channel and ground entry site) is made with that platform. The HF Cellular server then connects the radio site to the control center operator being addressed by the mobile platform. The interconnection process is completely transparent to the mobile platform operator and to the control center operator. The unused/unlinked radio sites are free to accept additional calls with other mobile platforms or control center operators. Extremely good overlapping and redundant coverage is provided by having multiple radios sites distributed within the areas requiring HF communications. HF Cellular enables extremely high link reliability and a very high call capacity. HF Cellular provides not only frequency diversity through the use of ALE, but also geographical diversity through the distributed radio sites. Radio sites may have one or more HF transceiver, or be split transmitter and receiver sites depending on communications capacity required.

HF CELLULAR IMPROVES LINKING

It is estimated that manual (non-ALE) linking on the first attempt is successful less than 15-30 percent of the time. By adding ALE, the first attempt success rate jumps to greater than 90 percent (based on experience with the US Customs Service). By using a HF Cellular architecture with multiple radio sites strategically placed throughout an area, the first attempt success rate is improved to greater than 98 percent with significantly improved link reliability and availability throughout the coverage area. Lower-noise communications are also provided as HF Cellular selects the best channel and the best radio site.

FEATURES

> Seamless HF communications coverage using diverse ground HF sites
> Best station linking
> Network analysis at a glance
> Multi net multi group coverage
> Call forwarding
> Faulted radios detection/avoidance
> No ground station sounding required
> Extended spectrum capacity
> No null areas with proper system design
> Increased average link quality
> Decreased ALE link times
> Redundancy capacity
> Secure communications compatible
> User friendly ICON based GUI
> Active platforms ICON display
> Simultaneous calling (collision avoidance)
> Busy channel avoidance
> Radio fault display
> Intercom call routing
> SOS priority call routing
> OTAD monitor alerting
> Loopback testing
> VO/IP ready
> TRACS compatible
> Call history logging
> Activity history logging
> Interagency operations
> Generic user interface (HyperTerminal and audio)
> Phone patch compatible

Net controller subscribers

2-4 wire circuits — Control / Audio

56KB DDS line — Multiplexed control and audio

DSL/ISDN/cable — VO/IP control and audio

Phone patch

2-PSTN lines — Control / Audio

ALE mobile subscribers

Pooled ground assets
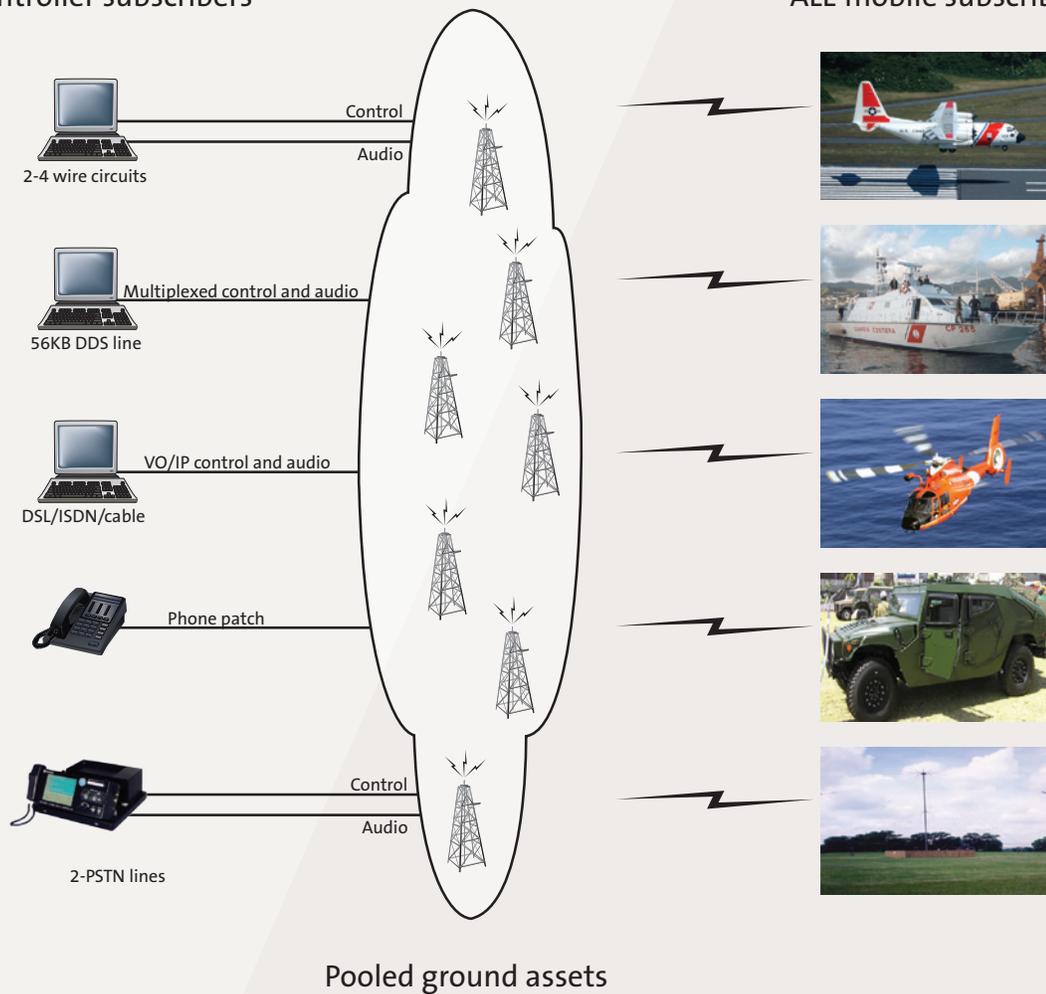
SPECIFICATIONS

Mobile subscriber compatibility specifications

ALE	JITC certified MIL-STD-181-141B ALE systems
Scan rate	½ second per channel minimum
Mode	3 kHz SSB passband
Tune time delay	ALE asset must allow 10 seconds of tune time
Frequency	HF 2 – 30 Mhz

Network controller compatibility specifications

Auto phone patch	Standard POTS telephone
Dial RCC	Qty 2 PSTN or POTs telephone lines and a DIAL RCC controller
RCC – 2 line	Qty 2 each 4 wire dedicated line and an RCC controller
RCC – VOIP	Qty 1 – Internet subscriber line (DSL, ISDN or Cable) and an RCC controller
RCC – 56 KB	Qty 1 – Dedicated 56 KB DDS line
RCC – Direct	Direct connection

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

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Rockwell Collins delivers smart communication and aviation electronics solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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