An Alternative to ACP-126/127 Message Formatting

Abstract

The ACP-126 has been declared no longer in force. The ACP-127 documentation has also been frozen. A useful and concise message addressing and routing format would be useful during the current and continuing Grand Solar Minimum which reduces the effectiveness of HF radio communications. Minimizing the byte count of the headers and addressing of a formal traffic message will allow more data to be transferred between stations in less time, and thus with greater reliability.

Additionally, simplifying the header and addressing information makes it more accessible to those who must read, understand and act on that data to effect message relay or delivery activities. Current ACP message formatting is largely built around the notion of the Teletype machine, which is largely no longer in use. A 5-bit alphabet for messages, certain "functions" in the process of creating messages and other seemingly unusual requirements of the current ACP's are largely legacy features which have no place in modern technological implementations of record traffic origination and delivery.

Proposal

This paper proposes a message formatting alternative, informally named "Condensed Message Formatting" (CMF) which would use key elements from both ACP-126 and ACP-127 in order to create addressing and routing headers which are both human readable and machine processable. This would enable and encourage automated message routing between stations. While both aforementioned ACP formats discourage the mixture of call signs with routing indicators, it is the contention of this paper that when combined together, they create a very concise way to route messages from end point to end point, or from an end piont to an "address group".

These "rules" lend themselves well to a form of routing not unlike an Internet routing protocol RIPv2, where each "router", or in the case of HF radio systems, "relay" need only know the "next hop relay" for that message.

Where 2G ALE or 3G ALE systems may be in place, the "relay" becomes an ALE station. The CMF header and addressing data can be directly mapped to a "relay table" (like a routing table in Internet parlance) of ALE addresses. Thus, when a message arrives at a relay station, it's CMF header is evaluated by the included Routing Indicators which make up the "domain" feature of the addressing. The Routing Indicator is then mapped to a "next hop" ALE address. Automated systems might spin up an ALE link and transfer the message automatically. Manual systems may simply display the "next

hop" to the end user for link creation activities. Such "relay tables" might also include secondary and perhaps tertiary ALE addresses as well.

The routing and addressing format is one where familiar elements are used to indicate not only the route the message should take in a "tape relay" type communications circuit, but also the actual sender recipient(s) of the message. This combines the strengths of ACP-126 station to station communications with the strengths of ACP-127 tape relay communications into a single format which can be leveraged for both uses.

The CMF will leverage the generally accepted military network message protocol specified in the ACP-201 for it's basic formatting. ACP-201 provides sufficient leeway in it's specification to make CMF instantly compliant.

Basic CMF Formatting for Routing and Addressing

The CMF format for routing and addressing is combined into a familiar user@domain construct which is instantly familiar as a way to address Internet e-mails.

callsign@routing-indicator = the basic routing and addressing format which identifies both the sender and the recipient of the message.

Examples of Message Addressing

Individual Station Addressing:

Station BLUE7 has a "home" routing indicator aof "UABCD". A message addressed to this station would appear as : "BLUE7@UABCD" in the CMF.

Group of Stations Addressing:

Station Group "REGION3" has a "home" routing indicator of "UAREG3". A message addressed to all stations in the station group would appear as : "REGION3@UAREG3" in the CMF

Broadcast Station Addressing:

Broadcast addresses could be sub-categorized, but in general, a broadcast address might appear as: "ALL@UAREG3" if all stations in Region 3 needed to be contacted.
Other examples : "STAFF@UAREG3", "MOG@UAREG3", etc.

Combining the addressing types in a single message would appear separated by the familiare " DE " syntax :

BLUE7@UABCD DE GREEN5@UABCE

This formatting clearly defines to individual stations for origination and receipt.

ALL@UAREG3 DE BLUE7@UABCD

This formatting shows an individual station BLUE7 addressing all stations in UAREG3

STAFF@UAREG3 DE OPS@UANHQ

This formatting shows the operations staff at a national headquarters addressing the staff group of Region 3.

Multiple Addressing:

BLUE7@UAREG3 BLUE5@UAREG3 GREEN4@UAREG2 DE OPS@UANHQ

The operations staff sends a message to three individual stations BLUE7, BLUE5 and GREEN4.