RAYNET

DATA

PROCEDURE

INDEX

1. SUMMARY

This document specifies a suite of Data Procedures recommended for RAYNET use.

The Procedure has been designed to optimise the rapid and unambiguous transmission and receipt of messages via data modes, to be understood equally by RAYNET and other Amateur Emergency Communications organisations. For this reason it includes appropriate extracts of well proven standard prosigns and procedures currently used by several services and organisations.

2. INTRODUCTION

The last presentation of a 'Data' procedure was in the RAYNET manual of 1986 with the publication of a RTTY procedure. Since that time data modes have moved on significantly with a great number of modes available, each suitable for a particular combination of speed, accuracy resilience. No matter what mode is in use however, it must be remembered that a message may pass through all modes between acceptance and delivery and the basic format of the message must remain unchanged. Data modes (just as with voice or CW) are only a 'wrapper' which we place around the User Services message for transmission via the Amateur Service, this wrapper will change depending upon conditions and requirements if the message is transferred from a voice to CW to data net on route to its destination.

Under routine circumstances the RAYNET Voice procedure will allow messages to be handled by relatively unskilled operators. However there may be times when the volume of messages exceeds that which can be carried by a voice network alone. Data modes in conjunction with the relevant sections of the UK amateur radio licence would allow unlicensed operators to key in the messages required to be passed at speeds which would exceed that allowed by voice modes. Some modes permit the sending of messages direct to e-mail, this is obviously a great advantage to the User Services but caution must always be exercised that data circuits do not get overloaded and that any messages passing in the User Service to Amateur Network direction are screened for compliance with licence conditions.

3. THE PROCEDURES

The recommended Procedures assume as a starting point that each operator is fully familiar with the Formal Message format described in the Voice Message procedure and the functions of the various parts of the message preamble.

The Procedures are separated into sections reflecting groups of data modes with similar characteristics. This is necessary to distinguish between those modes (such as 'connected' AX25 packet) which will attempt to reassemble a message in the correct order from the received parts and those such as APRS ('unconnected' AX25 packet) where there is no guarantee that packets will be displayed in the correct order.

3.1 **PROCEDURAL ABBREVIATIONS, PROSIGNS AND PROWORDS**

The following Abbreviations, Prosigns and Prowords have been well established in the Amateur Service and should be adopted for RAYNET use.

ABBREVIATION/ PROWORD	MEANING	COMMENT
AA	All After	Indicates part of a message, used to get missing parts of message.
AB	All Before	Indicates part of a message, used to get missing parts of message.
AR	End of Message	End of formal text, this is followed by B if there is another message to copy of N if this is the only or last message..
AS	Standby, Wait	
B	More	Another message to follow
C	Correct; Yes	
CFM	Confirm	i.e. Confirm I am correct.
CK	Check	
DE	From; This is	Proceeds station identification.
EMERGENCY	I have a message of life and death urgency.	Use ONLY for life and death urgency. Military may use “FLASH”
IMMEDIATE	I have a message of life and death urgency.	Use ONLY for life and death urgency. Military may use “FLASH”
K	Go ahead; over; reply expected	Invitation to transmit.
N	Negative; Incorrect; no more.	No more messages to follow.
NNNN	End of Message	
NR	Message Number	Message follows.
PBL	Preamble	First Part of Message
SIG	Signed; Signature	Last Part of Message
TEL	Telephone Number	
TU	Thank You	
WA	Word After	Indicates part of a message, used to get missing parts of message.
WB	Word Before	Indicates part of a message, used to get missing parts of message.

ABBREVIATION/ PROWORD	MEANING	COMMENT
X	Full Stop	Used by ARRL to indicate Full Stop. This usage permits the use of this punctuation mark to be included in the word or check count.
ZCZC	Message follows	

3.2 **MESSAGE PRECEDENCE**

The great majority of messages will have ROUTINE precedence. ROUTINE messages do not need to have the precedence stated.

Definitions

ROUTINE	A message which has only the normal degree of urgency.
PRIORITY	A message which has more than the normal degree of urgency.
IMMEDIATE	A message which is extremely urgent – e.g. LIFE IS AT RISK.
EMERGENCY	A message which is extremely urgent – e.g. LIFE IS AT RISK. (Preferred usage on HF).

Method of use

For IMMEDIATE/EMERGENCY messages the precedence should be transmitted in full at the start of the transmission offering the message, all other precedences should be transmitted as single letter abbreviations , i.e. ‘R’- Routine and ‘P’ – Priority. For example; G9CCC de G9BBB, 1 EMERGENCY LONDON, 1R CHESTER K
This allows G9CCC as Net controller to recognise the presence of an emergency message for routing to London and one routine for Chester. The Net Controller can then prioritise and locate stations to take the messages accordingly.

3.3 **ESTABLISHING THE NET**

The net Controller, or Senior Controller for a major event, will hold a briefing meeting during which RAYNET's objectives will be explained. Each RAYNET operator will be allocated a location and the Net frequencies will be assigned.

After operators have been deployed to their locations, each will report his arrival and state of readiness to the net Controller using his personal callsign. The net Controller will make the appropriate log entry. Radio Checks will be made and the net is ready for operation when all operators have established communication.
Some data modes do not lend themselves to net operations, either due to frequency stability or addressing requirements, the time taken to establish a connection or the one to one nature of some error correction protocols. The Net Controller should determine which outstations should be able to communicate directly with each other and initiate the necessary Radio Checks at this stage. Once messages start to flow the net is likely to evolve into one with a number of point to point links separated in frequency and possibly time.

3.4 FORMAL MESSAGE PROCEDURES

3.4.1 RTTY/ PSK31

Messages should begin with the code ZCZC on a single line to denote that the following text is a formal message.
The preamble is sent as one line followed by the address on a separate line.
Extra Space should be used between parts of address, which again is transmitted as a single line.
Carriage Return/Line feeds should be used to separate text from address and signature
Add a CFM line under the signature consisting of all names, numerals and unusual words in the message in the order transmitted.
End the message with the code NNNN on a single line to mark the end of the formal message. Further messages may be sent in the same transmission encapsulated in the ZCZC/NNNN format but balance the need to send multiple messages against the risks of data corruption during transmission which may call for excessive repeats.
An example message would appear as;
ZCZC
<LF>
NR 137 R G9DDD 15 WOKING 1900 FEB 17
John Smythe 14 South Avenue Chester CH99 7AZ
Tel 0560 0010131
<LF>
Please pass information on resources required from Red Cross via RAYNET as soon as possible
<LF>
Bryan Dilflox
<LF>
CFM SMYTHE 0560 0010131 DILFLOX
<LF>
NNNN

3.4.2 PACKET/AMTOR/GTOR/PACTOR

Since these are all connected modes with an automatic connection between two stations messages can be transmitted between them in the same manner as RTTY to preserve the message formatting with the added security of error checking and correction using these modes.

More advanced groups however may find it better to use the bulletin board or mailbox facility of the Terminal Node Controller in conjunction with a pre-engineered network to allow the messages to be automatically routed and stored. There are a variety of means to achieve this with Winlink (http://www.winlink.org) and its RMS Packet derivative finding favour with some groups through the ability of these systems to interconnect with the public e-mail system. There are other ways of achieving this however in situations where an adhoc network is required and the public telecommunications service is still available, see APRSLINK below.

3.4.3 **APRS**

This text is adapted from the APRS Protocol Reference v1.0.1 APRS can be used to transport formal messages. This uses the existing APRS message format for backwards compatibility, by adding a 3-character NTS format identifier **N**x**** at the start of the APRS Message Text, as follows:

N#number****precedence****originator****check****place****time****date
NAaddress_line1****address_line2****address_line3****address_line4
NPphone number
N1line 1 of message text
N2line 2 of message text
N3line 3 of message text
N4line 4 of message text
N5line 5 of message text
N6line 6 of message text
NSSignature block
NRReceived from****date_time****sent_to****date_time

All of these fields are as described in the formal message procedure.

Each message line is addressed to the same station.

The **N#**, **NA** and **NR** lines are multiple fields combined for APRS transmission efficiency. The backslash separator is used so that conventional forward slashes may be embedded in messages. (The backslash does not exist in the RTTY or CW alphabets, so it therefore cannot appear in a formal message).
Each line may be up 67 characters long, including the 3-character format identifier. Lines in excess of 67 characters will be truncated.
There is a maximum of 6 lines of message text.
Note: The **N#**, **NA**, **NS** and **NR** fields are required. The others are optional.
Serialisation of each line is handled by the normal APRS Message ID **{**xxxxx.
An APRS application is not required to understand or generate these messages. The information can be read and understood in the normal message display.

3.4.4 **APRSLINK**

There are currently two APRS Servers based in the USA called WLNK-1 and WLNK-2 which monitor APRS packets relayed onto the internet. By the use of ‘format identifiers’ in a similar way to that described for APRS above it is possible to pass e-mail traffic to and from the internet via an unconnected packet network provided that the RF network does not become overloaded.

Detailed information on the system may be obtained from http://www.winlink.org/aprslink.htm and a current command list is reproduced overleaf.

Available Commands	
H or ?	Return brief **H**elp. Help is also returned whenever APRSLink does not understand a command. Use "**?"** followed by a command letter for detailed help for that command. Example: "**?**L" for help with the List command.
L	Return a **L**ist of pending messages (a maximum of 5 are returned). The List command queries the Winlink email server and builds a list of up to 5 recent messages. Other commands operate on this list of messages.
R#	**R**ead message number # (# is one of the numbered messages returned via the List command). Example: "R2"
Y#	repl**Y** to message. Reply to message number # (# is one of the numbered messages returned via the List command). Example: "Y2"
W **W#** **/EX**	**W**rite multi-line message. These commands are issued using **multiple** APRS messages W <email "to" address or callsign> W1 [subject] W2 First line of message W3 Second line of message W4 Another message line /EX Example: W sam@iam.net W1 Green Eggs And Ham W2 I do not like Green Eggs and Ham W3 I do not like them W4 Sam, I am /EX Individual message lines can be submitted in any order and corrected prior to telling APRSLink to send the message. Please wait for an acknowledgement from APRSLink between each command especially if you don't have a real good path to your IGate. If desired, you can use the **P**layback command to see what you've composed prior to sending it.
/EX	Complete and send the composed message. You should receive a confirmation message.
P	**P**layback message. Play back message lines for the message being written ("W" command).
A **AL**	Create/update an alias for an email address. Example: A sam=sam@somelongdomainname.net The use "W sam" instead of "W sam@somelongdomainname.net" To delete an alias omit the part after the equal sign. "A sam=" will delete the sam alias To get a list of all your aliases send "AL"

F#	**F**orward message number # to address or callsign following F# (# is 1 to 5)(# is one of the numbered messages returned via the List command). Example: "F2 you@home.net"
K#	**K**ill (mark as deleted) message number # (# is one of the numbered messages returned via the List command). Example: "K3"
T	Return information about closest active Telpac gateway. This command also causes a new APRS object for the Telpac station to be sent out to the APRS-IS (to see this on RF a local IGate would need to be configured to gate this type of object back to RF - contact your IGate sysop to get this set up) .
M	Return information about closest active PMBO/RMS
I	Return **I**nformation about APRSLink

4. **CONCLUSION**

Some Group Controllers and Net Controllers will, with justification, want local variations of the recommended Procedure and its examples above. There can be no objection to minor variations but it is STRONGLY ADVISED there should be NO DEVIATION from the PHONETIC ALPHABET; also, ALL THE RECOMMENDED LIST of PROWORDS and PHRASES SHOULD BE USED, but others may be **added** to suit local wishes provided their meaning would be obvious to other Groups.

If you do want to make variations take care not to lose sight of the principal aims of a Standard RAYNET Procedure, which are.....

.....to enable different Groups, perhaps from well separated Zones of the UK, to work together at short notice without further training, in a disaster scenario, and exchange messages quickly with complete accuracy and lack of ambiguity.

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RAYNET NATIONAL EMERGENCY PLANNING TEAM 2009.

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SPACE FOR OPERATOR'S NOTES BELOW:

RAYNET MESSAGE FORM

NUMBER	PRECEDENCE * ROUTINE PRIORITY IMMEDIATE EMERGENCY	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	FILING TIME	FILING DATE

Originator's name in BLOCK letters :

FROM DATE TIME	TO DATE TIME
REC'D	SENT

* delete where not applicable

Guidance notes for completing the RAYNET message form.

1. Use BLOCK CAPITALS for addresses. If your writing is anything less than good, it is best to use block capitals throughout.
2. Write full stops as ⊙ or 'X' to avoid their getting lost in the text.
3. Figure 0, spoken zero is written as Ø. Write fractions, mathematical and other signs in words e.g. 2.5 as two point five, ⅞ as seven eights.
4. For time always use four figures on the 24 hours system e.g. 0830 hrs; 1530hrs.