MPG-6 SUPPORT GUIDANCE, W3YVQ, MPG6A9V15AICSG

ICS FORM GUIDANCE
V15A - 12/15

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6A9.1 ADOPTION OF THE FEMA/NIMS ICS MESSAGE FORMAT

In 2015 the ARRL Programs and Services Committee asked the NTS to add the FEMA/NIMS ICS 213 message format to the messaging types permitted in the NTS and NTSD. Note that this requires the adoption of the ICS 213 message format by all parts of the NTS including the NTSD and all the NTS "manual" voice and CW networks. It also requires, per the ARRL ARES[1] Manual, that ARES stations at any level be capable of handling messaging containing email-formatted text per this guidance.

The message format from which the text content is to be derived is stipulated in the FEMA/NIMS Forms Pamphlet 502-2, as amended, and available on the FEMA web resources. The ICS 213, and other ICS forms, were originally intended for office use within command centers operated under the NIMS/ICS, and is not suited for use on radio or other third party communications systems without the addition of tracking, delivery, and accountability information; and without the use of protocols suited for

[1] ARES is a registered trademark of the ARRL, Newington, CT, all rights reserved.

transmitting case and punctuation.

Prior to the P&SC request the means to send the ICS form content was already included in the capabilities of the Radio-email layer provisions of the MPG-6 established in the NTS/NTSD system in 2004, and published in the MPG at HQ in 2014 (section 6.2.15, MPG6V14A, 3/14). When ICS form-derived text content is transported via the Radio-email layer, the Radio-email envelope automatically provides the tracking and accountability information. Messages are in the email format and may include the augmented delivery information required for third party routing and contacting the addressee by telephone, email, etc. The body text or attached binary text-files carry the email-formatted content of the ICS form. Other binary files such as images and documents may also be attached.

Also, prior to the P&SC request, the NTSD had already incorporated the means to send the ICS form text content, in the full email format, as the text of Radiograms (between the “breaks”) sent via the NTSD through the already functioning NTSD HF Hub system. The NTS had already agreed that an appropriate means for handling ICS form content via Radiogram services was by including the ICS form text content as the text of the Radiogram, other parts of the message being formatted as in the standard Radiogram.

The implications of the P&SC request now, however, impose for the first time the requirement to be able to transmit the full email-formatted text content by both the digital and the manual voice and CW modes. Thus the NTSD DRS stations, all stations operating in the NTS manual voice and CW nets, and ARES operators at all levels, must be able to transmit the email-formatted text content. Providing this capability does not come without incurring additional overhead in the transmission of such email-formatted textual content compared to transmission of the Radiogram. Every attempt is made in this document to provide as simple a protocol as possible to minimize that overhead while providing the means to stations to convey the case and punctuation of such text with clarity and lack of ambiguity. The protocol is intended to build upon the Radiogram methods, adding additional or expanded prowords, prosigns, and operational groups as needed to address the additional character sets and format. This allows us to build upon what the Field Organization has already become trained to use rather than designing totally new protocols.

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6A9.2 THE NTS/NTSD/ARES MESSAGE FORMATS - 2015

1) RADIOGRAM, The standard message form used in the NTS/NTSD for decades (capital letters, "/", and figures only; X=period, R=decimal point in figures, DOT=for periods in email or URL, DASH=hyphen in long zip, other punctuation spelled out, HX_ and Time optional):

PREAMBLE: **[NR] [PREC]** [opt. HX_] **[STN ORIG] [CK] [PLC ORIG]** [opt. TIME] **[MON] [DT]**
ADDRESSEE
ADDRESS
CITY, STATE, ZIP
PHONE
EMAIL
OP NOTE (optional)
BT
TEXT (typically 25-30 groups max., 5/line)
BT
SIGNATURE (multiple lines with contact info optional)
OP NOTE (optional)

2) HYBRID RADIOGRAM, The standard Radiogram message format used in the NTS/NTSD for decades, as above, but with an **email-formatted text** and Check of **ICS XX**:

PREAMBLE: **[NR] [PREC]** [opt. HX_] **[STN ORIG] ICS XX [PLC ORIG]** [opt. TIME] **[MON] [DT]**
ADDRESSEE
ADDRESS
CITY, STATE, ZIP
PHONE
EMAIL
OP NOTE (optional)
BT
TEXT (**Email-formatted text,** derived from ICS or other forms, etc.)
BT
SIGNATURE (multiple lines with contact info optional)
OP NOTE (optional)

3) RADIO-EMAIL, The standard (MPG6) email-formatted message used on the Winlink system or peer-to-peer station transfers of Radio-email:

To:	(multiple addressees including Winlink clients and/or internet clients)
Cc:	(multiple addressees including Winlink clients and/or internet clients)
Subj:	(message subject, including request to QSL the email by reply as required)
Body text (Full email format. **Type 1** Radio-email carries Radiogram(s) in the body text or attachment files, or carries attached Radiogram Batch Files for transport to NTSD stations for import, with a QSL of the email by the single recipient client required. **Type 2** is normal email messaging, which might include text derived from ICS forms when text-file attachments are not used. May contain additional contact information needed for delivery and/or replies. **Type 3** may contain Radiogram PBL and ADDR for email-formatted messages. **Type 4** may contain Radiogram PBL and ADDR, or another network address, for re-filing for forwarding by the recipient client.)	
Attachment Icons, shown by the Radio-email client software when attachments are included.	
Attached binary files. (Which might include an entire ICS form derived text in full email format attached as a text file (8x3.txt), small GIF or JPG files, small document files, etc.; small relative to available bandwidth on the slowest link in the path to the recipient.)	

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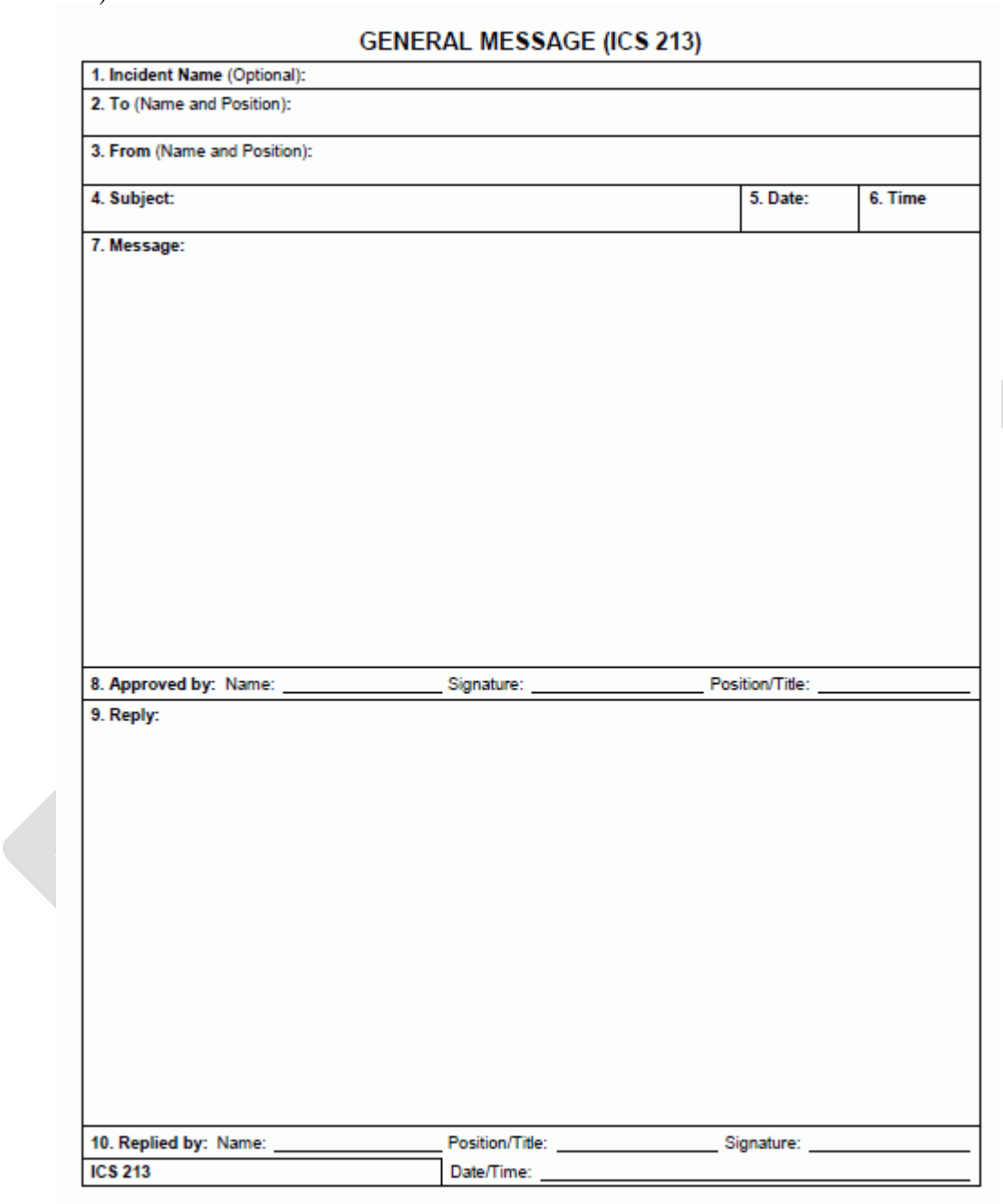
6A9.3 DERIVED ICS FORM CONTENT

The ICS forms contain cell blocks with borders and block titles. Within the respective cells, text data is entered by the form user according to those block titles. (Fig. 1 below.)



GENERAL MESSAGE (ICS 213)

1. Incident Name (Optional):		
2. To (Name and Position):		
3. From (Name and Position):		
4. Subject:	**5. Date:**	**6. Time**
7. Message:		
8. Approved by: Name: _____ Signature: _____ Position/Title: _____		
9. Reply:		
10. Replied by: Name: _____ Position/Title: _____ Signature: _____		
ICS 213	Date/Time: _____	

FIGURE 1: THE ICS 213 FORM (REDUCED TO ABOUT 60% OF NORMAL SIZE)

For Amateur Radio handling of ICS message forms, it is stipulated that the text content will be derived from the form blocks including the block numbers and titles, and the text content of the cells, but excluding the "(Optional)" and "(Name and Position)"

parenthetical form reminders. This provides a text-only rendition of the message content. Such message content derived from the ICS forms is in the "standard" email format with upper and lower case plain letters, figures, and the punctuation permitted in the standard ASCII keyboard set used in normal email applications (excluding ASCII characters above 127 decimal, other control characters, and all special formatting characters for font sizes, types, colors, html text, etc.). Forms other than the ICS 213 may be handled by the NTS/NTSD messaging services in the same manner, always keeping in mind the practical limits on the bandwidth required over radio circuits. The outline of the derived text from an ICS 213 form is shown below in Fig. 2.

GENERAL MESSAGE (ICS 213)

1. Incident Name:

2. To:

3. From:

4. Subject:

5. Date:

6. Time

7. Message:

8. Approved by:
Name:
Signature:
Position/Title:

9. Reply:

10. Replied by:
Name:
Position/Title:
Signature:
Date/Time:

ICS 213

FIGURE 2: DERIVED TEXT OUTLINE FROM ICS 213 FORM

Note: The notes (Optional) in block 1, and (Name and Position) in blocks 2 and 3, appear on the ICS form to guide local form users, are **not** included here, and are **not** to be transmitted.

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6A9.3.1 EXAMPLE OF DERIVED TEXT AND RADIOGRAM

GENERAL MESSAGE (ICS 213)
1. Incident Name: Test Viral Pandemic
2. To: Jeffrey Fineman MD, UW Health Executive Officer
3. From: Daniel Medefsky MD, UT Southwestern Medical Director
4. Subject: TEST Antiviral Resources Available
5. Date: 2015 10 01
6. Time 1432Z
7. Message:
TEST MESSAGE
UT Southwestern has the following antiviral supplies available to assist with treatment of your pandemic victims. Please advise what you need and where to ship them via FedEx. Contact Doctor Stevens at 972-555-1212 or respond to this message.

Drug	Dosage	Units Available
Tamiflu	75mg	1200
Relenza	5mg	650 (Inhaler)
Rapivab	600mg	200 (IV vial)
Amantadine*	750mg	1500 (Tablets)
Flumadine	100mg	2500 (Tablets)

*** Note not for use with Influenza type A**
TEST MESSAGE

8. Approved by:
Name: Dr. Philip Stevens
Signature:
Position/Title: UT SW Coordinator

9. Reply:

10. Replied by:
Name:
Position/Title:
Signature:
Date/Time:
ICS 213

FIGURE 3: TEXT CONTENT EXAMPLE DERIVED FROM AN ICS 213 FORM

A text file of the Figure 3 content may be attached to Radio-email messages; or the hybrid Radiogram into which the content is embedded would look like this:

101 P K6JT ICS XX PLANO TX 1432 OCT 1
JEFFREY FINEMAN MD UW HEALTH EXECUTIVE OFFICER
(Full address with city/state/zip and telephone number and/or email address. Op Notes optional. Radiogram format.)
BT
[GENERAL MESSAGE (ICS 213) - the ICS block content shown in Figure 3 - email format.]
BT
DANIEL MEDEFSKY MD UT SOUTHWESTERN MEDICAL DIRECTOR
(Full address with city/state/zip and telephone number and/or email address for reply if necessary. Op Notes optional. Radiogram format.)

FIGURE 4: RADIOGRAM WITH EMAIL-FORMATTED TEXT EMBEDDED

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6A9.3.2 SOFTWARE AND FILENAME NOTES

There is interactive software available to users of such forms to enter block information and export the text content to a file for transmission, or such file creation may be done manually in text editors. It is recommended to consider use of an editor such as *Notepad++™*[2] for such production since that editor can be set to ensure an output file with the proper carriage return and line feed character set ("standard pair"). In some editors, unusual CR and LF combinations may be used and are often copied when using a copy and paste sequence to create a file for sending. Windows Notepad[3] will not always show such unusual combinations. The proper output text file may then be attached to Radio-email, or the content may be "pasted" into the text of a hybrid Radiogram for handling on the NTSD or NTS.

Unless approved by the NTS/NTSD, attached text-file filenames, where permitted by NTSD Hub software, should be limited to the 8x3 format with the .TXT extender to accommodate operators using older computer operating systems. The same 8x3 filenames and extender should be used when attaching ICS form content to Radio-email as well, for the same reason.

The creators of *FLMSG*[4] and others provide software for the creation and export of ICS 213 form information to text files. Contact the Area ADCs or Region Hub operators in your Area for detailed information on the use of this approach to handling the ICS form input and output.

6A9.4 RADIO-EMAIL TRANSPORT OF ICS FORM CONTENT

When appropriately derived ICS form text content is transported via the Radio-email layer, the Radio-email envelope automatically provides the tracking and accountability information, and such messages may include in the body text the augmented delivery information required for third party routing and contacting the addressee by telephone, email, site station call sign, etc. The body text may also contain the ICS form content but it is more often attached as a text file to facilitate managing the delivery.

Attached binary text-files typically carry the email-formatted content of the entire ICS form derived text content as shown above. Unless approved by the NTS/NTSD stations handling the messages, these text file filenames should be limited to the 8x3 format with the .txt extender to accommodate operators using older computer operating systems. For delivery via Radio-email, the modern long filenames with the .txt extender may work fine. The Radio-email may be sent directly to clients on the Winlink network or sent via peer-to-peer transfers between NTS/NTSD/ARES stations.

The implications of the content for Radio-email stations is significant should it be

[2] https://notepad-plus-plus.org/
[3] Notepad™ is an editor application in Windows™, both registered by the Microsoft Corp.
[4] FLMSG provides software for entering ICS 213 data and exporting files containing that data, including a format for transmission by attached files which may be used for printing the original form style with box borders, etc. See FLMSG at: http://www.w1hkj.com

necessary to download and forward messaging containing ICS form content via manual voice or CW mode outlets. In such cases, where ARES is providing site contact, the EMCOMM providers will need to be familiar with protocols needed to send email-formatted text on voice and CW nets in addition to the standard Radiogram sending protocols. When sending ICS form content on voice or CW from one station to another having the ICS form handy, the message envelope may not be required, but the protocol for transmitting email-formatted content is required.

6A9.5 NTSD TRANSPORT OF ICS FORM CONTENT

Prior to the P&SC 2015 request, the NTSD had already incorporated the means to send the ICS form content, in the full email format, as the text of Radiograms sent via the NTSD through the already functioning NTSD HF Hub system.

Such messaging contains the normal Radiogram Preamble, Address, Signature, and Op Notes. The only change for handling the ICS form content is the inclusion of the appropriately derived ICS email-formatted text content between the “breaks”.

The Digital Relay Stations (DRS) of the NTSD may download such messages from the NTSD Hub stations and deliver the content to the addressee at the destination, normally via Radio-email or via other local digital means. This service has been operational since at least 2014 through the original Winlink-Classic hubs and the new BPQ hub software.

The implications of the content for DRS stations is significant should it be necessary to download and forward messaging containing ICS form content via manual voice or CW mode outlets. In such cases, where ARES is providing site contact, the EMCOMM providers will need to be familiar with protocols needed to send email-formatted text on voice and CW nets in addition to the standard Radiogram sending protocols. When sending ICS form content on voice or CW from one station to another having the ICS form handy, the message envelope may not be required, but the protocol for transmitting email-formatted content is required.

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6A9.6 ICS FORMAT DIFFERENCES

ICS Fundamental Differences:

There are several important differences in the email-formatted texts derived from ICS forms to consider in the protocols for voicing and CW sending:

1) The amateur operator does not have a choice regarding formatting. The ICS message text content must be transmitted as received from the originating official or agency;
2) Upper and lower case letters must be noted in transmission, and copied;
3) All the standard keyboard punctuation used for email may also be present and must be noted as symbols in transmission, and copied;
4) Integral spaces in the received format must be noted in transmission and copied where they are imbedded (such as in filenames including spaces, or in stand-alone punctuation);
5) There are two parts to the ICS 213, the **original** outbound part, and the **reply** part. **Message replies include both the original and reply parts.** If the responder does not wish to include all of the original received information in the reply he may create a new ICS outbound form with sufficient information to relate it to the original.
6) The **CHECK** of hybrid Radiograms carrying ICS form derived text content shall begin with the letters "ICS" followed by a space and the letters "XX" (see below). The check of **ICS XX** therefore alerts the receiving operator that ICS form derived text content in the email format will be sent in the text.
7) The length of the message content in ICS 213 forms is virtually unlimited, and, with the exception of possible new software products designed to count all the block numbers, titles, and other message parts, the Check of Radiograms carrying the derived ICS text will be entered as "**ICS XX**". If such software becomes needed or available, the actual text group count, including any stand-alone punctuation, etc., may be entered as figures in place of the "XX". No Check is required for derived ICS texts carried in text-file format (8x3 filenames) attached to Radio-email.
8) Generally, the definition of a **group** still stands, ignoring case but including symbols, as any series of permitted characters with no spaces between them (except in embedded filename spaces, etc.), and a white space on the left and on the right, and including such a series of characters beginning a new line. This creates uncertainty about how software might count groups for a Check when there are embedded spaces within filenames, but if the same rules are applied at both ends of the circuit, the Check may still accomplish its purpose.
9) There are special rules when sending Radiograms for voicing the Preamble and parts of addresses and signatures, and for voicing multiple messages in book form. **The protocol provided for voice and CW sending of email-formatted text content affects only the text of the hybrid message, or that of an email-formatted Radio-email text, when relaying or delivering the message by manual voice or CW means.** The protocols for sending the hybrid Radiogram Preamble, Address, and the Signature, including any Op Notes, are the same as for sending the Radiogram (MPG2 & MPG3).
10) Expanded Sending Protocols: Review the ICS 213 Form, the derived text outline, and the example derived text embedded within a Radiogram, or attached to Radio-email as a text file, as shown in sections above. You will see that all sorts of upper/lower case letters, figures, and symbols are permitted in any combination, and spaces may be relevant and important. Letter case can be extremely important when sending technical and medical data and special care must be taken to preserve the integrity of the original message content through to delivery.

To accomplish the transmission and copy of the ICS Form derived text content in email format, new protocols will be provided below for voicing on phone and sending on CW.

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6A9.7 TABLES OF PUNCTUATION, VOICING, CW

6A9.7.1 TABLE OF VOICE AND CW PUNCTUATION

Note: The voice and CW symbol names are concatenated as single groups or abbreviations. Some of these symbols may also be used as Prowords or Prosigns (see the next section). Use care to avoid conflicts. Use care to avoid ambiguity if the words "symbol for" or "S/" appear in the message text.

- On **voice**, the group in the phone column is voiced after the introductory words "symbol for". Note that some names are concatenated words.
- On **CW**, the group in the CW column is sent after the Prosign "S/" except as noted.

SYM	NAME	PHONE "SYMBOL FOR[xx]"	S/[xx] OPTIONAL CW ABBREVIATIONS	DIGRAPH & NOTES
`	ACCENT	ACCENT	S/ ACCENT	
&	AND SIGN	ANDSIGN	S/ANDSIGN	<AS> (1)
'	APOSTROPHE	APOSTROPHE	S/APOST	<WG>
*	ASTERISK	ASTERISK	S/ASTERISK	
@	ATSIGN	ATSIGN	S/ATSIGN, or [.--.-.]	(2)
\	BACKSLASH	BACKSLASH	S/ BACKSLASH	
{	BRACE, OPEN	OPENBRACE	S/OBRC	
}	BRACE, CLOSE	CLOSEBRACE	S/CBRC	
[	BRACKET, OPEN	OPENBRACKET	S/OBKT	
]	BRACKET, CLOSE	CLOSEBRACKET	S/CBKT	
^	CARET	CARET	S/CARET	
:	COLON	COLON	S/ COLON	<OS>
,	COMMA	COMMA	S/COMMA, or [--..--]	(3)
-	DASH (MINUS SIGN)	DASH	S/DASH	
.	DECIMAL POINT	DECIMAL	S/DECIMAL, or [.-.-.-]	(3)
$	DOLLAR SIGN	DOLLARSIGN	S/DOLLAR	<SX>
.	DOT	DOT	S/DOT, or [.-.-.-]	(3)
=	EQUAL SIGN	EQUALSIGN	S/ EQUALSIGN	<BT> (1)
!	EXCLAMATION	EXCLAMATION	S/EXCLAM	<KW>
>	GREATER THAN SIGN	GREATERTHANSIGN	S/ GREATERTHANSIGN	
-	HYPHEN	HYPHEN	S/HYPH	<NV>
<	LESS THAN SIGN	LESSTHANSIGN	S/ LESSTHANSIGN	
-	MINUS SIGN (DASH)	MINUSSIGN	S/MINUSSIGN	<NV>
(	PARENTHESIS, OPEN	OPENPAREN	S/OPAREN	<KN>
)	PARENTHESIS, CLOSE	CLOSEPAREN	S/CPAREN	<KK>
%	PERCENT SIGN	PERCENTSIGN	S/PERCENT	<OSO>
.	PERIOD	PERIOD	S/PERIOD, or [.-.-.-]	(3)
|	PIPE SIGN	PIPESIGN	S/ PIPESIGN	
+	PLUS SIGN	PLUSSIGN	S/ PLUSSIGN	<AR> (1)
#	POUND SIGN	POUNDSIGN	S/POUND	
?	QUESTION MARK	QUESTIONMARK	S/QUERY	
"	QUOTE (STRAIGHT)	QUOTE	S/ QUOTE	<AF>
;	SEMICOLON	SEMICOLON	S/ SEMICOLON	<KR>
/	SLASH (TEXT CHAR.)	SLASH	"/", or [-..-.]	(4)
	SPACE	SPACE	S/ SPACE	
	TAB (NEXT COLUMN)	TAB	S/TAB	
~	TILDE	TILDE	S/ TILDE	
_	UNDERSCORE	UNDERSCORE	S/ UNDERSCORE	<UK>

Notes: (Only straight quotes shown. For smart quotes use openquote, S/Oquote, etc.)

1. These codes conflict with CW Prosigns. Use the "S/[symbol]" method.
2. Although officially adopted as the "@" code, many may not yet be familiar with its use. The "S/ATSIGN" may be the better choice until the new code is widely known.
3. These codes are generally in use and may be used without the "S/…" Prosign.
4. The "/" may be used as in note 3 above, keeping in mind that the "/" is also part of the Prosign "S/", hence care must be taken to avoid ambiguity where the characters "S/" are in a group, where the better choice is to use the "S/SLASH" transmission on CW.

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6A9.7.2 SUMMARY OF PROWORDS/PROSIGNS/OPERATIONAL GROUPS

These symbols are generally in use in amateur radio traffic handling and the code for them is widely recognized. There are conflicts, however, between the uses of some of these symbols (from the punctuation table above) and Prosigns used as operational commands. Where those conflicts are encountered, the "symbol for [symbol name]" on voice, or "S/[symbol name]" on CW, may be used.

FUNCTION	PROWORDS VOICE	PROSIGNS CW	CW CODE
ARL Precedes Check if ARL Numbered Radiograms in the text.	**ARL**	**ARL**	
BREAK (=) START/END TEXT	**BREAK**	**<BT>**	**– . . . –**
NEW LINE (CR-LF)	**NEWLINE**	**<AA>**	**. – . –**
START OF MESSAGE	**NUMBER**	**NR**	
END OF MESSAGE (+)	**END**	**<AR>**	**. – . – .**
SYMBOL FOR…	**SYMBOL FOR…**	**S/**	
UPPER CASE…	**UPPERCASE…**	**UC/**	
LOWER CASE…	**LOWERCASE…**	**LC/**	
TITLE CASE (1st letter cap)	**TITLECASE**	**TC/**	

FUNCTION	OPERATIONAL WORDS VOICE	OPERATIONAL WORDS CW	CW CODE
"I SAY AGAIN" on error, go back and repeat last group correctly sent and then continue	**I SAY AGAIN**	**?**	**. . – – . .**
"I SAY AGAIN" for emphasis. repeat the group or phrase for emphasis or clarity	**I SAY AGAIN**	**?**	**. . – – . .**
"I SPELL" voice the group, then go back and spell the group with letters or phonetics (the later for proper names of persons or places	**I SPELL**		
"WAIT" (See "&" below.)	**[WAIT]**	**<AS>**	**. – . . .**
See the MPG2 (voice) and MPG3 (CW) for additional operational words, fill requests/responses, confirm, etc.			

6A9.7.3 SPECIAL FORMATTING EXTREMES, BOLD, ITALICS, ETC.

The following Prowords or Prosigns may be used to start and stop special text formatting in the rare instances where it must be transmitted and copied. The concatenated word group examples in the table below are sent in full like separate groups but are not copied by the receiving operator. (Transmission of this kind of formatting dates back to the press telegraphy Phillips Code methods.) Thus it is even theoretically possible to transmit font types and size changes, text color, etc. A message text might begin with the command "STARTFIXEDSYSTEMFONT" (for the slashed zero font with fixed character pitch, followed by the corresponding "STOP…" at the end of the text. The table of examples below obviously does not show all possible choices. Operators will have to mutually agree on the copying method in use.

As communications providers it will be helpful to ask served agency users to avoid such formatting if at all possible. Use of such formatting not only decreases manual transmission efficiency, but constrains attached binary file content sent via Radio-email to be in non-text format which requires much larger file sizes. Formatted “fancy text” document files are generally much larger than plain text files and should be used only in extreme cases where agency purposes can be served only by such transmissions.

Since manual copy of such formatting is difficult, the receiving operator must note the format of the affected groups in a convenient manner to allow formatting the transcribed text later in an editor. (Many operators use the underline to remind themselves of groups to be confirmed or repeated. An alternative may need to be chosen. Italics, bold, strikethrough, superscript, etc., may have to be circled with the format type noted for later reproduction.)

If the receiving operator is copying with an editor which allows such formatting, such as full capability word processors, transmission pauses must be allowed at each stop command for the operator to select the text and then select the variety of formatting to apply. A few examples:

FUNCTION	PROWORDS VOICE	PROSIGNS CW
BOLD TYPE	**STARTBOLD… …STOPBOLD**	**STARTBOLD… …STOPBOLD**
ITALICS TYPE	**STARTITALICS… …STOPITALICS**	**STARTITALICS… …STOPITALICS**
STRIKETHROUGH TYPE	**STARTSTRIKETHROUGH… …STOPSTRIKETHROUGH**	**STARTSTRIKETHROUGH… …STOPSTRIKETHROUGH**
SUPERSCRIPT TYPE	**STARTSUPERSCRIPT… …STOPSUPERSCRIPT**	**STARTSUPERSCRIPT… …STOPSUPERSCRIPT**
UNDERLINED TYPE	**STARTUNDERLINE… …STOPUNDERLINE**	**STARTUNDERLINE… …STOPUNDERLINE**

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6A9.7.4 TABLE OF ADDITIONAL UNUSED CW SYMBOL CODES

Additional symbols, not currently in use, which might be used if it is known that the receiving operator is familiar with the code and use.

SYM.	SYMBOL NAME (Not Currently in Amateur Radio Use)	CODE	DIGRAPH
&	AMPERSAND (Also Wait Prosign.)	.-...	<AS>
'	APOSTROPHE	.----.	<WG>
:	COLON	---...	<OS>
$	DOLLAR SIGN	...-..-	<SX>
=	DOUBLE DASH, NEW PARA. (CR-LF-LF)	-...-	<BT> (Break)
!	EXCLAMATION-POINT	-.-.--	<KW>
-	HYPHEN, MINUS-SIGN	-....-	<NV>
(	PARENTHESIS (OPEN)	-.--.	<KN>
)	PARENTHESIS (CLOSE)	-.--.-	<KK>
+	PLUS-SIGN, NEW PAGE (CR-LF-LF-LF)	.-.-.	<AR>
"	QUOTATION MARK	.-..-.	<AF>
;	SEMICOLON	-.-.-.	<KR>
_	UNDERSCORE	..--.-	<UK>

6A9.7.5 TABLE OF UNUSED PRESS TELEGRAPHY PHILLIPS CODES

These symbols are two or three letter groups that either stand for a symbol or indicate the types of characters to follow. They are generally not in use in amateur radio message handling, but were widely used along with a large set of abbreviations for transmitting press text traffic on the legacy telegraph circuits.

SYM.	SYMBOL NAME	PHILLIPS CODE LETTERS
	Brackets [open	BX
	Brackets close]	BJ
	Capital letter (at start of word)	CX ...
	Capitalized Group (UC Initials) start	CN ...
	Capitalized Group (UC Initials) end	... CJ
:	Colon	KO
-	Dash	DX
$	Dollar Sign	SX
-	Hyphen	HX
	Paragraph Start (4 dashes)	[----]
(	Parenthesis (open	PN
)	Parenthesis close)	PY
%	Percent	OSO
“	Quote “open	QN
”	Quote close”	QJ
;	Semicolon	SI
	Underline start_	UX
	Underline _stop	UJ
_	Underscore	UX UJ

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6A9.8 VOICE PROTOCOL - VOICING EMAIL FORMATTED TEXT

Voicing email-formatted text introduces new overhead when transmitting messages. Rather than go back in history and attempt to derive voice versions of the press telegraphy methods for sending case and punctuation, such as the Phillips Code, we here will build upon the MPG Chapter 2 voicing methods, adding expanded introducers, new prowords to convey the group content, and new operational groups to allow conveying the layout of the text. In this manner all the training already accomplished for voicing Radiograms will allow moving up to this level of text transmission without having to learn a totally new approach. The objective, as with Radiogram voicing, is to use protocols which will convey to the receiving operator what is to be recorded for any kind of group in order achieve an exact copy of the original message.

Note that this protocol applies to voicing an email-formatted text found in the hybrid Radiogram, but the Preamble, Address, Signature, and Op Notes, formatted per Radiogram rules, are transmitted using the Radiogram Protocols found in MPG2. This protocol may also be used for sending the email-formatted text contents of a Radio-email over voice circuits.

VOICING RULES - VOICE	
CASE	Sentence-case formatted English email text typically has the first letter of the first word of a sentence capitalized. Other names and terms may also be capitalized. (These instances may be treated with "TITLECASE" or "MIXED GROUP" methods shown below.) The rest of the sentence groups typically use lower case letters, and, when written as plain words, are simply voiced and copied in lower case (the default). Each new group voiced will be considered to be lower case unless indicated otherwise. Some groups, particularly abbreviations, acronyms, and data units, may be all upper case, all lower case, or a mix of upper and lower case. The case of such groups must be preserved in transmission by using the appropriate introducers and prowords. An in-situ (in-place) command is used to define the case of the following letter(s), and remains in effect until the end of that one group unless changed (this is like setting the Caps Lock key). See the introducers and in-situ commands in the Group Voicing section below.
SYMBOLS	**PUNCTUATION:** Symbols are inserted into the voicing process using the in-situ prowords "**SYMBOL FOR**", followed by the punctuation symbol name as provided in the punctuation table. Those prowords do not indicate the start of a new group as an introducer does. The insertion of a symbol during transmission, therefore, is typically done where encountered in the flow of a sentence, between or within groups, or at the end. The punctuation ending the sentence may be inserted simply with the prowords "**SYMBOL FOR**", followed by the symbol name from the table, immediately after voicing the last group. Symbols may also be inserted with this in-situ command into introduced mixed groups at the beginning, within, or at the end of the group. **SPACE:** Where the combination of characters within groups may introduce any ambiguity about where the next group begins, as in the case where a space might be an integral part of a filename, the symbol "SPACE" has been added to the punctuation table. **TAB:** Where a space of variable length is needed to assist the receiving operator to align tables of data which may appear in the text, the symbol "TAB" has been added to the punctuation table. When not copying with a digital editor, the manual transcription may also be so guided to help align columns accordingly, although the Tab is not written.

6A9.8.1 GROUP VOICING

Introducers indicate the beginning of a new group. Introduced groups are voiced one character at a time, letters phonetically, when sending Radiograms. In this protocol, specifying case change and the insertion of symbols is permissible within the introduced group, but here we add a new concept. Capitalized groups may be introduced with TITLECASE and voiced as the entire word group rather than one character at a time, and the group may then be spelled as required. The group is copied capitalized. Sentence ending punctuation may be inserted using the "SYMBOL FOR" prowords and symbol name after voicing the last group.

INTRODUCER	GROUP VOICING
INITIAL(s)	Introduces a group of one or more all **uppercase letters** only. This is the same as the default Radiogram use of the introducer. Characters are voiced one character at a time always using phonetics. Voicing "INITIAL(s) UPPERCASE" is permissible for clarity if needed.
INITIAL(s) LOWERCASE	Introduces a group of one or more all **lowercase letters** only. Characters are voiced one character at a time always using phonetics.
MIXED GROUP	Introduces a new group containing a mix of case, figures, letters, or punctuation symbols, in any combination. The group is voiced one character at a time, letters phonetically, along with any additional case prowords or symbol insertions. (Exception: See TITLECASE below.) The **case** of letters will be introduced in-situ by the prowords "**UPPERCASE**" or "**LOWERCASE**" followed by the letter(s) phonetically. The case last given persists within the mixed group until the case is changed, or the end of the group. A **punctuation symbol** will be introduced in-situ by the prowords **"SYMBOL FOR"** followed by the appropriate voicing name for the punctuation symbol (see the table to follow). **Figures** within the mixed group are simply voiced one character at a time as encountered without additional introduction.
TITLECASE	Introduces a **capitalized** sentence **first word**, capitalized **names** of persons and places, or other capitalized **terms**. The group is voiced as "TITLECASE…" followed by the group voiced in its entirety. It is copied as a group with only the first letter in upper case, the remainder in lower case. Proper names of persons and places should be spelled with phonetics, however. Optionally, the group may be introduced as a MIXED GROUP using UPPERCASE ahead of the first letter, and LOWERCASE ahead of the remaining letters, all sent phonetically. The title case use is similar to the old CW Phillips Code CX.
MIXED GROUP FIGURE(s)	Introduces a new mixed group beginning with one or more figures, the characters treated as above for the mixed group. (Similar to the Radiogram introducer alerting the operator to beginning figures.)
FIGURE(s)	Introduces a new group consisting of only one or more figure(s). (Figure groups with decimal points are treated as mixed groups.) Characters are voiced/sent one character at a time (no compound numbers).
AMATEUR CALL	Introduces a call sign mixed group to be copied with all **uppercase letters** only. This is the same as the default Radiogram use of the introducer. Characters are voiced one character at a time, always using phonetics. Call signs with appended information are treated as mixed groups.

OPERATIONAL WORDS	
"I SPELL"	Groups may be spelled as needed using letters or phonetics. Proper names of locations, persons, and terms are always spelled with phonetics. Voice the single (1) group, then "**I SPELL**", then spell the group with letters or phonetics as required, and then continue with the next group. Repeat the "TITLECASE", as required, ahead of the group spelling for such capitalized groups.
"I SAY AGAIN"	Use the operational words **"I SAY AGAIN"**: 1) to correct an **error** in sending - go back and repeat the last correctly sent group, and then continue, or 2) to repeat a group or groups for **clarity/emphasis**.
"NEWLINE"	The proword **"NEWLINE"** will be voiced to indicate to the receiving operator that a new line in the message format follows. It must only be used between groups, not within a group (except at the end of the hyphen in a hyphenated group as written by the originator). Anticipate line character lengths about 70 characters in 12pt. fixed pitch. Use the command to wrap the text as needed. This command will be used to start a new line for a new block in the derived ICS content.
"BREAK"	The proword **"BREAK"** will be used to mark the beginning and ending of the text, respectively, each on a line of its own, copied as the two letters "**BT**". The first break is followed by a mandatory and expected listening pause for fill requests.
"PAUSES" - group spacing	Voicing groups is done with pauses between groups as is done when voicing/sending the Radiogram. A group-pause infers the beginning of a new group following a space. The group-pause, therefore, is critical for indicating to the receiving operator the group boundaries. The arguments of whether something was one or two words can be avoided by use of adequate pauses.
(CHECK)	The Check of a hybrid Radiogram carrying ICS derived email-formatted text will be voiced as "**ICS X-ray X-Ray**", and may be modified as in the Radiogram with the "/" to append a corrected check.

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6A9.8.2 VOICING EXAMPLES:

GROUP(s)	VOICING (… is a group pause)
A…AB	Initial Alfa …Initials Alfa Bravo (Initials upper case default)
a…ab	Initial lowercase Alfa (if clarity is needed, otherwise the letter “a” encountered in sentence case text is assumed to be lower case, hence simply “a”)…Initials lowercase Alfa Bravo
Md	Mixed Group uppercase Mike lowercase Delta
Md.	Mixed Group uppercase Mike lowercase Delta symbol for period
abMO	Mixed Group lowercase Alfa Bravo uppercase Mike Oscar
The	Titlecase THE; (Mixed Group uppercase Tango lowercase Hotel Echo)
…sentence end.	…SENTENCE…END symbol for period; (or; SENTENCE…Mixed Group lowercase Echo November Delta symbol for Period)
The lazy, brown fox ran.	Titlecase THE…LAZY symbol for comma…BROWN…FOX…RAN symbol for period. (note no group pause between ran and period)
W1AW	Amateur Call Whiskey One Alfa Whiskey (default upper case)
w1aw	Mixed Group lowercase Whiskey One Alfa Whiskey
W1AW/1	Mixed Group uppercase Whiskey One Alfa Whiskey symbol for Slash One
w1aw/1	Mixed Group lowercase Whiskey One Alfa Whiskey symbol for Slash One
WOo0lE1	Mixed Group uppercase Whiskey Oscar lowercase Oscar Zero Lima uppercase Echo One (Note the need to take care with fonts and pencil copy re the O and o case and zero, lowercase Lima (l) and 1, etc.)
bob@bob.net	Mixed Group lowercase Bravo Oscar Bravo symbol for Atsign Bravo Oscar Bravo symbol for Dot November Echo Tango
Robert L Smith	Titlecase ROBERT…initial Lima…Titlecase SMITH I spell Titlecase Sierra Mike India Tango Hotel
Bob C. Smith III	Titlecase BOB…Initial Charlie symbol for Dot…Titlecase SMITH I spell Titlecase Sierra Mike India Tango Hotel…Initials India India India
McDonald	Mixed Group uppercase Mike lowercase Charlie uppercase Delta lowercase Oscar November Alfa Lima Delta (title case insufficiently specific about multiple capitalization)
http://www.MD/index	Mixed Group lowercase Hotel Tango Tango Papa symbol for Colon symbol for Slash Symbol for Slash Whiskey Whiskey Whiskey symbol for Dot uppercase Mike Delta symbol for Slash lowercase India November Delta Echo X-ray
8…73	Figure Eight…Figures Seven Tree
6.	Figure Six Symbol for Period (Period or Dot equivalent)
-34	Mixed Group symbol for Minussign Tree Four
25%	Mixed Group Figures Two Fife symbol for Percentsign
38mg	Mixed Group Figures Tree Eight lowercase Mike Golf
38Mg	Mixed Group Figures Tree Eight uppercase Mike lowercase Golf
38MG	Mixed Group Figures Tree Eight uppercase Mike Golf
410 555 1234	Figures Four One Zero…Figures Fife Fife Fife…Figures One Two Tree Four (Some officials may use hyphens, slashes, parentheses, etc., which must be inserted, and 3 groups may become one or two.)
21200-1234 (zip)	Mixed Group Figures Two One Two Zero Zero symbol for Dash One Two Tree Four (no internal spaces, Dash or Hyphen are equivalent)

146.52	Mixed Group Figures One Four Six symbol for Decimal Fife Two (Dot and Period are equivalent)
3820KHz	Mixed Group Figures Tree Eight Two Zero uppercase Kilo Hotel lowercase Zulu
146.52MHz	Mixed Group Figures One Four Six symbol for Decimal Fife Two uppercase Mike Hotel lowercase Zulu
146.52 MHz	(treat as two separate mixed groups, or one mixed group with a space symbol inserted before the MHz)
The Word.doc (filename)	Mixed Group uppercase Tango lowercase Hotel Echo symbol for Space uppercase Whiskey lowercase Oscar Romeo Delta symbol for Dot Delta Oscar Charlie (integral space in filename)
…re-file…	Mixed Group lowercase Romeo Echo symbol for Hyphen Foxtrot India Lima Echo (hyphenated word with no internal spaces)
…now - then… (in sentence)	…NOW…Mixed Group symbol for Hyphen symbol for Space lowercase Tango Hotel Echo November… (NOW is default lower case, the pause & mixed group introducer implies the space before hyphen)
…30 - 54…	…Figures Tree Zero…Mixed Group symbol for Hyphen symbol for Space Fife Four (the mixed group implies the space before as above),
Rapivab 600mg 200 (IV vial) (multiple groups)	Mixed Group uppercase Romeo lowercase Alfa Papa India Victor Alfa Bravo…Mixed Group Figures Six Zero Zero lowercase Mike Golf… Figures Two Zero Zero…Mixed Group symbol for Openparen uppercase India Victor symbol for Space lowercase Victor India Alfa Lima symbol for Closeparen (mixed group is the better choice for the spelling of capitalized Rapivab -easier than using Titlecase, use of Space preserves the parenthetical group as an entity)

6A9.9 CW PROTOCOL - SENDING EMAIL FORMATTED TEXT

Sending email-formatted text introduces new overhead when transmitting messages. Rather than go back in history and attempt to re-introduce and train in the press telegraphy methods for sending case and punctuation, such as the Phillips Code, or learn all new CW characters for punctuation, we here will build upon the MPG Chapter 3 CW methods adding expanded prosigns to convey the group content, and new operational groups to allow conveying the layout of the text. In this manner all the training already accomplished for sending Radiograms will allow moving up to this level of text transmission without having to learn a totally new approach. The objective, as with Radiogram sending, is to use protocols which will convey to the receiving operator what is to be recorded for any kind of group in order achieve an exact copy of the original message. An advantage of CW is that all groups are spelled, hence introducer use calling for sending the group one character at a time is dispensed with profitably (sic).

Note that this protocol applies to sending an email-formatted text found in the hybrid Radiogram, but the Preamble, Address, Signature, and Op Notes, formatted per Radiogram rules, are transmitted using the Radiogram protocols found in MPG3. This protocol may also be used for sending the email-formatted text contents of a Radio-email over CW circuits.

SENDING RULES - CW	
CASE	Sentence-case formatted English email text typically has the first letter of the first word of a sentence capitalized. Other names and terms may also be capitalized. (These instances may be treated with the "**TC/**" (Titlecase) or individual case prosign methods shown below.) The rest of the sentence's plain word groups of lower case letters are simply sent and copied in lower case (the default). Each new group sent will be considered to be lower case unless indicated otherwise. Some groups, particularly abbreviations, acronyms, and data units, may be all upper case, all lower case, or a mix of upper and lower case. The case of such characters must be preserved in transmission by using the appropriate in-situ prosigns ("**UC/**" or "**LC/**"). These in-situ (in-place) commands are used to define the case of the following letter(s), and that case remains in effect until the end of that one group unless changed (**UC/** = Caps Lock on, **LC/** = Caps Lock off). See the prosigns and in-situ commands in the Group Sending section below.
SYMBOLS	**PUNCTUATION:** Symbols are inserted into the sending process using the CW character itself, or by using the in-situ prosign **"S/"** ("symbol for") followed by the punctuation symbol name as provided in the punctuation table. This "S/" prosign does not indicate the start of a new group as an introducer does on voice. The insertion of a symbol during transmission, therefore, is typically done where encountered in the flow of a sentence - between or within groups, or at the end. The punctuation ending the sentence may be inserted simply with the CW character itself, or the "S/" prosign and symbol name, with no group pause, right after sending the last group. Symbols may also be inserted at the beginning, within, or at the end of a mixed group containing other letters, figures, or case prosigns. (The "/" in this prosign is sent with the CW character [`_..._.`]. The "/", ".", and ",", and optionally the "@", [`.--.-.`], are sent as CW characters as encountered in text to be sent. Others must be sent using the "S/" prosign and the symbol name. Note that the symbol "**?**" is reserved for operational purposes on CW, and when encountered in the message must be sent using the "S/QUERY" prosign sequence. **SPACE:** Where the combination of characters within groups may introduce any ambiguity about where the next group begins, as in the case where a space might be an integral part of a filename, the symbol "SPACE" has been added to the punctuation table. **TAB:** Where a space of variable length is needed to assist the receiving operator to align tables of data which may appear in the text, the symbol "TAB" has been added to the punctuation table. When not copying using the tab with a digital editor, the manual transcription may still be so guided to help align columns accordingly, although the Tab itself is not written.
(No Introducers)	No introducer prosigns except "TC/" are used on CW to begin a group. The "UC/", "LC/", and "S/" are in-situ commands which may be used anywhere in a group. The prosign "TC/" does indicate the beginning of a new group and defines how the capitalized name or term is to be copied. See the PROSIGNS, TC/, in Group Sending-CW below.

6A9.9.1 CW GROUP SENDING

All groups are obviously spelled when sending, as in the Radiogram case, hence no group introducers are required, but here we add a new concept. Capitalized groups may be sent preceded by the title case prosign "TC/", the group sent in its entirety, and copied with the first character capitalized with the remainder in lower case by default. Additionally, punctuation may be sent using well-known CW characters, including decimal points in figure groups, or inserted using the "symbol for" prosign, "S/", in sentences, mixed groups, email addresses, and URLs, etc.

PROSIGN	GROUP SENDING - CW
UC/[letter(s)]	Upper case letter(s) will be introduced in-situ by the prosign **UC/** followed by the **upper case** letter(s). The case last given persists within that one group until the case is changed, or the end of the group.
LC/[letter(s)]	Lower case letter(s) will be introduced in-situ by the prosign **LC/** followed by the **lower case** letter(s). The case last given persists within that one group until the case is changed, or the end of the group.
S/[symbol]	A **punctuation symbol** for "**/**", "**.**", "**,**" (and optionally "**@**") may be sent in-situ using the CW characters, or may be introduced in-situ by the prosign "**S/**" followed by the appropriate voicing name for the symbol from the punctuation table.
"/", **"."**, **","** (**"@"**)	As mentioned above, an exception to sending punctuation symbols using "S/" is allowed for the Slash, Period, Comma, (and optionally for the "@") for which the commonly understood CW characters for those symbols may be used (without using the S/ prosign). Note that the "**?**" is reserved for operational purposes on CW and must be sent using the symbol insertion prosign sequence: "S/QUERY".
TC/[group]	The "TC/" prosign (title case) will be used to indicate a **capitalized** sentence **first word**, capitalized **names** of persons and places, or other capitalized **terms**. The group is transmitted as "TC/" followed by the group sent in its entirety. It is copied as a group with only the first letter in upper case, the remainder in lower case by default. (Optionally, the group may be sent using individual instances of the "UC/" and/or "LC/" prosigns.) In instances of group multiple capitalization, such as in names like "McDonald", the more rigorous approach is required using "UC/" and "LC/" as appropriate for the group characters. (The title case prosign is similar to the old CW Phillips Code CX.)
PAUSES - group spacing	Sending groups is done with pauses between groups as is done when sending the Radiogram. A group-pause infers the beginning of a new group following a space. The group-pause, therefore, is critical for indicating to the receiving operator the group boundaries. The arguments of whether something was one or two words can be avoided by adequate pauses. Thus the use of "UC", "LC", and "S/" is usually done by sending the prosigns without a separate group pause. See the examples for the unusual instance of hyphen use, with a space before and after, in which the group pause is helpful in conveying the format.
<AA>	The prosign **<AA>** may be used to indicate to the receiving operator that a new line in the message format follows. It must only be used between groups, not within a group (except at the end of the hyphen in a hyphenated group as written by the originator). Anticipate line character lengths about 70 characters in 12pt. fixed pitch. Use the Prosign to wrap the text at that point as needed. This command will be used to start a new line for a new block in the derived ICS form content.
<BT>	The prosign <BT> (=) will be used to mark the beginning and ending of the text, respectively, each on a line of its own, copied as the two letters "BT". Due to conflict with the "=", use S/Equalsign for that character.

?	The question mark is reserved on CW to: 1) to go back and repeat the last correctly sent group, and then continue, to correct an error in sending, or 2) to repeat a group or groups for clarity/emphasis.
(CHECK)	The Check of a hybrid Radiogram carrying ICS derived email-formatted text will be sent as "**ICS XX**", and may be modified as in the Radiogram with the "/" to append a corrected check.

6A9.9.2 CW SENDING EXAMPLES:

GROUP(s)	CW SENDING (… is a group pause)
A…AB…	UC/A …UC/AB… (equivalent to Initial use capital default on voice)
a…ab…	a…ab…(sentence lower case default applies). (For clarity if needed, LC/a…LC/ab)
Md	UC/M LC/D
Md.	UC/M LC/D [. – . – . –]; or UC/M LC/M S/Period
abMO	LC/AB UC/MO
The	TC/THE
…sentence end.	…SENTENCE…END [. – . – . –]; (or; SENTENCE…END S/Period (default lower case assumed)
The lazy, brown fox ran.	TC/THE…LAZY [– – . . – –]…BROWN…FOX…RAN [. – . – . –]; or TC/THE…LAZY S/Comma…BROWN…FOX…RAN S/Period
W1AW	UC/W1AW
w1aw	LC/W1AW
W1AW/1	UC/W1AW [– . . – .]1; or UC/W1AW S/Slash 1
w1aw/1	LC/W1AW [– . . – .]1; or LC/W1AW S/Slash 1
…Woo0lE1…	…UC/WO LC/O 0 L UC/E 1… [Note the need to take care with fonts and pencil copy re the O and o cases and zero (0), lowercase Lima (l) and 1, etc. Note that LC persisted from "o" through "l".]
bob@bob.net	LC/BOB S/Atsign BOB S/Dot NET; or LC/BOB [. – – . – .] BOB [. – . – . –] NET
Robert L Smith	TC/ROBERT…UC/L…TC/SMITH
Bob C. Smith III	TC/BOB…C [. – . – . –]…TC/SMITH…UC/iii
McDonald	UC/M LC/C UC/D LC/ONALD (title case is insufficiently specific about multiple capitalization)
http://www.MD/index	LC/HTTP S/Colon [– . . – .] [– . . – .] www [. – . – . –] UC/MD [– . . – .] LC/INDEX; or LC/HTTP S/Colon S/Slash S/Slash www S/Dot UC/MD S/Slash LC/INDEX
8…73	8…73 (CW characters as written)
6.	6 [. – . – . –]; or 6 S/Period (Period or Dot equivalent)
-34	S/Minussign 34
25%...	25 S/Percent…
38mg	38 LC/MG
38Mg	38 UC/M LC/G
38MG	38 UC/MG
410 555 1234	410…555…1234 (CW characters as written. Some officials may use hyphens, or slashes in phone numbers, in which case the sequence becomes one group, instead of 3, with the symbols inserted using S/Hyphen. If Slashes are used, the "/" CW character may be sent. Some may use parentheses around the area code. Use S/Oparen, etc.)
21200-1234…	21200 S/Dash 1234… (no internal spaces) Dash & Hyphen equivalent.

146.52	146 [.-.-.-] 52…; or 146 S/Decimal 52…
3820KHz	3820 UC/KH LC/Z (no internal spaces)
146.52MHz	146 [.-.-.-] 52 UC/MH LC/Z (no internal spaces or group pauses)
146.52 MHz	146 [.-.-.-] 52…UC/MH LC/z; or 146 S/Decimal 52…UC/MH LC/z (Space before M. Treated as two separate mixed groups, as above, or one mixed group with a space symbol inserted before the MHz.)
The Word.doc (filename)	UC/T LC/he S/Space UC/W LC/ORD [.-.-.-] DOC (integral space in the filename, S/Dot may be used in place of the period character)
…re-file…	LC/RE S/Hyphen FILE… (hyphenated word with no internal spaces)
…now - then… (in sentence)	…NOW S/Space S/Hyphen…LC/THEN…(NOW is default lower case, the group pause implies the space before LC/THEN, note group space positions are different than the voicing syntax)
…30 - 54…	…30 S/Space S/Hyphen…54 (the group pause implies the space before 54 as above. In other words the first group is [30 -])
Rapivab 600mg 200 (IV vial) (multiple groups)	TC/Rapivab…600 LC/MG…200…S/Oparen UC/iv S/Space LC/vial S/Cparen (use of the Space preserves the parenthetical group as an entity)

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Page last updated FEB 23, 2016
Changes: Left>Open, Right>Close, S/Lparen>S/Oparen, S/Rparen>S/Cparen, etc., for braces, brackets

W3YVQ, DEC 23, 2015