Q-CALL
A Method of **Providing** Selective Calling for AMTOR
Using Mode-B Collective **Broadcast (Bc)**

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1. Introduction

This **document defines a method of providing** a **Selective Group** Calling (SGC) **facility on top of** CCIR Rec **476-3 (AMTOR)** MODE-Bc[1]. SGC has **application on 80 meters and VHF where propagation provides consistent communications.** It provides a **mechanism to allow a group of stations to intercommunicate without printing messages of other groups or individuals sharing the channel,**

There are two ma**j**or **features of a SGC facility for** CCIR **476 that must** be **provided regardless of the final facility definition. First, the facility must be, or have the potential to become, a recognized amateur radio standard. Secondly, it must be possible to provide the facility either within a** CCIR **476 code converter** or **external to it. Below is a proposal that** I **feel meets these needs. First the** major **facility requirements and constraints are outlined then the proposed transmission and reception procedures are given.**

2. Requirements

The following items were **considered to be** requirements **for the facility. Additional requirements may** be **added at a later time but those** listed below **should be considered fundamental.**

2.1 Label ing

The method used to implement SGC should have a distinctive label in the RTTY terminology. I have **chosen Q-CALL as a label because it is a** literal **description of the proposed calling mechanism and it is unique to RTTY terminology.** Q-CALL **uses for** its **SELCALL the letter Q followed by the 4 non-control characters of the** CCIR 476 **"call" signal.**

2.2 Resistance to Falsing

The sequence of characters that forms the SELCALL for SGC should be something that would be unlikely to occur during **normal communications.**

2.3 Group Calling

The facility should have **the ability to** concatenate **SELCALLs so that a true "group"** calling capability exists rather than **simply the** ability to send one **SELCALL that many stations** respond to. **When one SELCALL** is shared among several **users the calling** station can not change the **groupings; this is undesirable.**

2.4 Generation of **SELCALL Information**

The SGC SELCALL string should be **such that it can be generated either internal or external to the** CCIR **476 code converter without critical timing requirements.**

2.5 Detection of SELCALL Information

The SGC SELCALL string should be such that it can be detected either internal or external to the CCIR **476 code converter without critical timing requirements.**

2.6 Generation of End-of-Communications Signal

The SGC *'end-of-communication*' signal should be such that it can **be generated either internal** or external to **the CCIR 476 code converter.**

2.7 Detection of End-of-Communications Signal

The SGC *'end-of--communication" signal should be **such that it can be detected either internal or external to the** CCIR **476 code converter.**

3. Q-CALL Proposal

The **signaling to provide these features can** be **simple to implement. What follows are the current recommended procedures** for the Q-CALL SGC **facility.**

3.1 Generation of SELCALL Signals

Each Q-CALL SELCALL will be formed by a CR, LF, LTRS, **and the following sequence repeated 8 times: "Q" "wxyz" "SPACE".** Within the sequence **"SPACE" is defined to be the character SPACE, "Q" is defined to be the character Q and "wxyz" is** defined **to be the four non-control characters of the** CCIR **476 "call" signal normally used for MODE-A communications. For group broadcast, several SELCALLs may be concatenated** by **sending** the first, **then the** second[2]**, and so on until all** desired SELCALLs have been transmitted. **During "SELCALL GENERATION" the inter-character time may not exceed 30 seconds.**

3.2 Generated Message Content

All messages must begin with a **CR** or a LF character. The **message may be in any format** except that the sequence NNNN is prohibited and **during the message transmission the** inter-

character time may not exceed 30 seconds.

3.3 Generation of End-of-Communications Signal

End-of-communication will be signaled by the transmission of the character sequence NNNN followed by the CCIR 476 MODE-Bc end-of-communication signal (3 alpha characters).

3.4 Detection of SELCALL Signals

When the Q-CALL processor detects the sequence: "Q" "wxyz" "SPACE" "Q" "wxyz" "SPACE" "Q" "wxyz", it will set a SELCALL-DETECT flag[3] indicating that a valid Q-CALL SELCALL has been detected, provided that the inter-character time of the received characters does not exceed 45 seconds. With in the Q-CALL sequence "SPACE" is defined to be the character SPACE, "Q" is defined to be the character Q and "wxyz" is the four non-control characters of the CCIR 476 "call" signal normally used for MODE-A communications by the receiving station. When the Q-CALL processor detects that a CR or LF character has been received and that the SELCALL-DETECT flag is set, a DATA-OUTPUT flag will be set.

3.5 Message Reception

Each teleprinter character received by the Q-CALL processor will be passed to the teleprinter[4] while the DATA-OUTPUT flag is set.

3.6 Detection of End-of-Message Signal

When no characters have been received for 45 seconds, or the character sequence NNNN has been received, or the CCIR 476 MODE-Bc end-of-communications signal (3 alpha characters) has been received the DATA-OUTPUT and SELCALL-DETECT flags will be reset.

4. Rational of Q-CALL Mechanism for Transmission and Reception

4.1 Selection of SELCALL Signals

Any SGC SELCALL built on top of AMTOR should be something that makes use of the MODE-A "call" signal and is easily readable by an operator. It should be all letters case so that the Q-CALL processor does not need to worry about handling FIGS and LTRS characters[5]. The call should be repeated, without LTRS, FIGS, or any other extraneous characters for at least 8 repetitions. Eight repetitions ensures that the SELCALL will have a high probability of being detected during less than optimum propagation conditions. CCIR 476 "call" signals are often sent using MODE-Bc and repeated several times with only one space separating them[6]. For that reason, I have included a "Q" and "SPACE" as part of the SELCALL string for a visual delimiter rather than just a space. Including a CR and LF at the beginning of each SELCALL ensures that detectors provided external to a CCIR 476 code converter will "see" the SELCALL[7]. It also ensures that anyone monitoring the channel with conventional MODE-Bc equipment will be capable of reading all SELCALLs that are part of a group without having the

printer over-write information at the end of a line.

4.2 Selection of End-of-Communications Signal

The NNNN is easily detected by external equipment and the standby condition is easily detected internal to the CCIR 476 converter. The time-out feature is added to aid stations using an external Q-CALL detector.

5. Procedures for a Q-CALL Transmission

The Q-CALL transmission sequence should be functionally as follows:

1. Set code converter to MODE-Bc transmit.

2. Send CR, LF and LTRS.

3. Send 8 repetitions of the "selective call" (ex., ... QAADI QAADI QAADI . ...).

4. If necessary send another new-line sequence and send any other SELCALL sequences needed. Repeat this step until all SELCALLs have been transmitted.

5. Send the message (the first character of any message must be either a line-feed or carriage-return).

6. Send NNNN and switch to standby.

EXPLICIT EXAMPLE

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=================================================
((transmitter on, MODE-Bc))

QRA AD71
QAABC QAABC QAABC QAABC QAABC QAABC QAABC QAABC
QWXYZ QWXYZ QWXYZ QWXYZ QWXYZ QWXYZ QWXYZ QWXYZ
QWABC QWABC QWABC QWABC QWABC QWABC QWABC QWABC
QWDEF QWDEF QWDEF QWDEF QWDEF QWDEF QWDEF QWDEF

AB12C, W2XYZ, W2ABC, W2DEF DE AD71

A NEW STATION IS NOW ACTIVE ON THIS FREQUENCY.
W2GHI IS ON USING SELCALL WGHI FROM NEW YORK
CITY. W2GHI IS OPEN MODE-A FROM 7PM TO 9PM
LOCAL TIME AND OPEN FOR Q-CALL 24 HOURS A DAY.

AB2C, W2XYZ, W2ABC, W2DEF DE AD71
NNNN
((standby))
=================================================
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-- NOTES --

1. CCIR 476-3 defines MODE-B with two parts: COLLECTIVE (broadcast to all stations) and SELECTIVE (broadcast to one or a group of station(s)). I refer to MODE-B COLLECTIVE as MODE-Bc and MODE-B SELECTIVE as MODE-Bs. Throughout this document, terminology from CCIR Rec 476-3 has been used, where appropriate, to reduce confusion. A major

change Is the use of the CCIR 476 term "call" signal rather than the more common SELCALL of AMTOR.

2. effectively on a newline because of the CR LF within each SECALL string.

3. Alternatively, the SELCALL-DETECT flag may be set when the Q-CALL processor detects the sequence: "Q" "wxyz" "SPACE" "Q" "wxyz", provided that the receiving station has user-selectable option of using the longer sequence.

4. Including the character that caused the DATA-OUTPUT flag to be set.

5. this would be a problem for systems that use external Q-CALL processors and ASCII terminals.

6. this is often done using MODE-Bc to tell party B what party C's "call" signals are.

7. Some CCIR 476 units wait until a CR or LF is detected in MODE-Bc before outputting characters to the teleprinter.