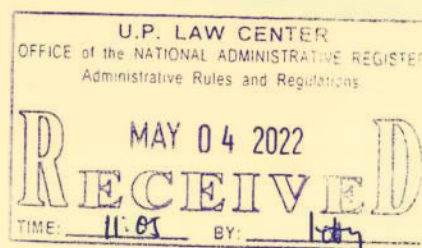




Republic of the Philippines  
**CIVIL AVIATION AUTHORITY OF THE PHILIPPINES**

**MEMORANDUM CIRCULAR NO.: 012-2022**



**TO : ALL CONCERNED**  
**FROM : THE DIRECTOR GENERAL**  
**SUBJECT : AMENDMENT TO PHILIPPINE CIVIL AVIATION REGULATIONS  
– AIR NAVIGATION SERVICES (CAR-ANS) PART 8  
AERONAUTICAL TELECOMMUNICATIONS GOVERNING VOICE  
COMMUNICATION SYSTEMS FOR THE ADOPTION OF  
AMENDMENT 91 TO ANNEX 10 VOLUME III PART 2**

**REFERENCE:**

1. Philippine Civil Aviation Regulations – Air Navigation Services Part 8 Aeronautical Telecommunications Governing Voice Communication Systems.
2. ICAO Annex 10 Volume III Part 2 Amendment 91.
3. Regulations Amendment Procedures
4. Board Resolution No. 2012-054 dated September 2012.

Pursuant to the powers vested in me under the Republic Act 9497, otherwise known as the Civil Aviation Authority Act of 2008 and in accordance with the Board Resolution No. 2012-054 dated 28 September 2012, I hereby approve the incorporation of ICAO Annex 10 Volume III Part 2 Amendment 91 to the Philippine Civil Aviation Regulations Air Navigation Services (CAR-ANS) Part 8.


**ORIGINAL REGULATIONS SUBJECT TO AMENDMENT:**

**8.3 SELCAL SYSTEM**

8.3.1 Until 2 November 2022, Where a SELCAL system is installed, the following system characteristics shall be applied:

- a) *Transmitted code.* Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones. The pulses shall be of 1.0 plus or minus 0.25 seconds duration, separated by an interval of 0.2 plus or minus 0.1 second.
- b) *Stability.* The frequency of transmitted tones shall be held to plus or minus 0.15 per cent tolerance to ensure proper operation of the airborne decoder.
- c) *Distortion.* The over-all audio distortion present on the transmitted RF signal shall not exceed 15 per cent.
- d) *Per cent modulation.* The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones. The combination of tones shall result

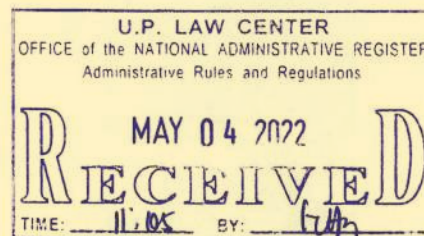
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Records Officer II  
Central Records and Archives Division

in a modulation envelope having a nominal modulation percentage as high as possible and in no case less than 60 per cent.

e) *Transmitted tones.* Tone codes shall be made up of various combinations of the tones listed in the following table and designated by colour and letter as indicated:

<i>Designation</i>	<i>Frequency (Hz)</i>
<i>Red A</i>	312.6
<i>Red B</i>	346.7
<i>Red C</i>	384.6
<i>Red D</i>	426.6
<i>Red E</i>	473.2
<i>Red F</i>	524.8
<i>Red G</i>	582.1
<i>Red H</i>	645.7
<i>Red J</i>	716.1
<i>Red K</i>	794.3
<i>Red L</i>	881.0
<i>Red M</i>	977.2
<i>Red P</i>	1083.9
<i>Red Q</i>	1202.3
<i>Red R</i>	1333.5
<i>Red S</i>	1479.1



*Note 1 — It should be noted that the tones are spaced by  $\text{Log}^{-1} 0.045$  to avoid the possibility of harmonic combinations.*

*Note 2 — In accordance with the application principles developed by the Sixth Session of the Communications Division, the only codes at present used internationally are selected from the red group.*


*Note 3 — Guidance material on the use of SELCAL systems is contained in the Attachment 8A, to CARANS Part 8 Guidance Material for Communication Systems.*

*Note 4 — The tones Red P, Red Q, Red R, and Red S are applicable, in accordance with 8.3.2.*

8.3.2 Until 2 November 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have SELCAL encoders in accordance with the red group in the table of tone frequencies of 8.3.1. SELCAL codes using the tones Red P, Red Q, Red R, and Red S may be assigned.

8.3.1 As of 3 November 2022, where a SELCAL system is installed, the following system characteristics shall be applied:

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a) Transmitted code. Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones. The pulses shall be of 1.0 plus or minus 0.25 seconds duration, separated by an interval of 0.2 plus or minus 0.1 second.

b) Frequency Stability. The frequency of transmitted tones shall be held to plus or minus 0.15 per cent tolerance to ensure proper operation of the airborne decoder.

c) Distortion. The overall audio distortion present on the transmitted RF signal shall not exceed 15 per cent.

d) Level stability. ~~Per cent modulation~~. The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones

8.3.1.1 As of 3 November 2022, modulation envelope. The combination of tones shall result in a modulation envelope having a nominal modulation percentage as high as possible and not less than 60 per cent.

e) 8.3.2 As of 3 November 2022, the ~~Transmitted tones~~. ~~Tone~~ codes shall be made up of various combinations of the tones listed in the following ~~Tables~~ 8.3-1. They are ~~and~~ designated by colour and letter or number as indicated:

Table 8.3-1. SELCAL tones designated by colour and letter or number  
(applicable as of 3 November 2022)

<i>Designation</i>	<i>Frequency (Hz)</i>
<i>Red A</i>	312.6
<i>Red B</i>	346.7
<i>Red C</i>	384.6
<i>Red D</i>	426.6
<i>Red E</i>	473.2
<i>Red F</i>	524.8
<i>Red G</i>	582.1
<i>Red H</i>	645.7
<i>Red J</i>	716.1
<i>Red K</i>	794.3
<i>Red L</i>	881.0
<i>Red M</i>	977.2
<i>Red P</i>	1083.9
<i>Red Q</i>	1202.3
<i>Red R</i>	1333.5
<i>Red S</i>	1479.1
<i>Red T</i>	329.2
<i>Red U</i>	365.2
<i>Red V</i>	405.0
<i>Red W</i>	449.3
<i>Red X</i>	498.3
<i>Red Y</i>	552.7
<i>Red Z</i>	613.1



Red 1	680.0
Red 2	754.2
Red 3	836.6
Red 4	927.9
Red 5	1 029.2
Red 6	1 141.6
Red 7	1 266.2
Red 8	1 404.4
Red 9	1 557.8

*Note 1.— ~~It should be noted that~~ The frequencies of the tones are spaced by  $\text{Log}^{-1} 0.0450.0225$  to avoid the possibility of harmonic combinations.*

*Note 2.— In accordance with the application principles developed by the Sixth Session of the Communications Division, the only codes at present used internationally are selected from the red group.*

*Note 3.— Guidance material on the use of SELCAL systems is contained in the Attachment 8A, ~~to CARANS Part 8~~ Guidance Material for Communication Systems.*

*Note 4.— The tones Red P, Red Q, Red R, and Red S are applicable after 1 September 1985, in accordance with 3.2.*

8.3.3 As of 3 November 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have SELCAL encoders that support all tones in accordance with Table 8.3-1.

8.3.4 As of 3 November 2022, SELCAL codes using the tones Red T through Red 9 as given in Table 8.3-1 shall only be assigned to SELCAL-equipped aircraft with the capability of receiving these tones.

— END —

## NEW/AMENDED REGULATIONS

### 8.3 SELCAL SYSTEM


8.3.1 Until 2 November 2022, where a SELCAL system is installed, the following system characteristics shall be applied:

a) *Transmitted code.* Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones. The pulses shall be of 1.0 plus or minus 0.25 seconds duration, separated by an interval of 0.2 plus or minus 0.1 second.

b) *Stability.* The frequency of transmitted tones shall be held to plus or minus 0.15 per cent tolerance to ensure proper operation of the airborne decoder.

c) *Distortion.* The over-all audio distortion present on the transmitted RF signal shall not exceed 15 per cent.

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d) *Per cent modulation.* The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones. The combination of tones shall result in a modulation envelope having a nominal modulation percentage as high as possible and in no case less than 60 per cent.

e) *Transmitted tones.* Tone codes shall be made up of various combinations of the tones listed in the following table and designated by colour and letter as indicated:

<i>Designation</i>	<i>Frequency (Hz)</i>
<i>Red A</i>	312.6
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<i>Red P</i>	1083.9
<i>Red Q</i>	1202.3
<i>Red R</i>	1333.5
<i>Red S</i>	1479.1

*Note 1.— It should be noted that the tones are spaced by  $\text{Log}^{-1} 0.045$  to avoid the possibility of harmonic combinations.*

*Note 2.— In accordance with the application principles developed by the Sixth Session of the Communications Division, the only codes at present used internationally are selected from the red group.*


*Note 3.— Guidance material on the use of SELCAL systems is contained in the Attachment 8A, Guidance Material for Communication Systems.*

*Note 4 — The tones Red P, Red Q, Red R, and Red S are applicable, in accordance with 8.3.2.*

8.3.2 Until 2 November 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have SELCAL encoders in accordance with the red group in the table of tone frequencies of 8.3.1 SELCAL codes using the tones Red P, Red Q, Red R and Red s may be assigned.

8.3.1 As of 3 November 2022, where a SELCAL system is installed, the following system characteristics shall be applied:

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a) *Transmitted code.* Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones. The pulses shall be of 1.0 plus or minus 0.25 seconds duration, separated by an interval of 0.2 plus or minus 0.1 second.

b) *Frequency stability.* The frequency of transmitted tones shall be held to plus or minus 0.15 per cent tolerance to ensure proper operation of the airborne decoder.

c) *Distortion.* The overall audio distortion present on the transmitted RF signal shall not exceed 15 per cent.

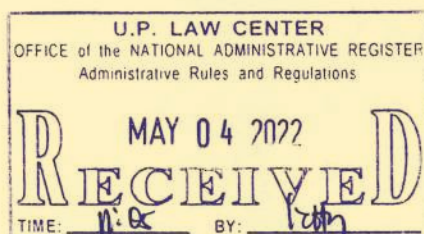
d) *Level stability.* The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones

8.3.1.1 As of 3 November 2022, modulation envelope. The combination of tones shall result in a modulation envelope having a nominal modulation percentage as high as possible and not less than 60 per cent.

8.3.2 As of 3 November 2022, the transmitted codes shall be made up of various combinations of the tones listed in Tables 8.3-1. They are designated by colour and letter or number as indicated:

Table 8.3-1. SELCAL tones designated by colour and letter or number  
(applicable as of 3 November 2022)

Designation	Frequency(Hz)
Red A	312.6
Red B	346.7
Red C	384.6
Red D	426.6
Red E	473.2
Red F	524.8
Red G	582.1
Red H	645.7
Red J	716.1
Red K	794.3
Red L	881.0
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Red P	1083.9
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Red 1	680.0



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Red 2	754.2
Red 3	836.6
Red 4	927.9
Red 5	1 029.2
Red 6	1 141.6
Red 7	1 266.2
Red 8	1 404.4
Red 9	1 557.8

*Note 1.— The frequencies of the tones are spaced by Log<sup>-1</sup> 0.0225 to avoid the possibility of harmonic combinations*

*Note 2.— In accordance with the application principles developed by the Sixth Session of the Communications Division, the only codes at present used internationally are selected from the red group.*

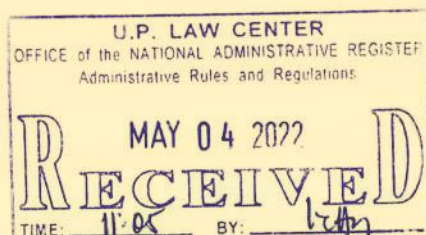
*Note 3.— Guidance material on the use of SELCAL systems is contained in the Attachment 8A, Guidance Material for Communication Systems.*

8.3.3 As of 3 November 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have SELCAL encoders that support all tones in accordance with Table 8.3-1.

8.3.4 As of 3 November 2022, SELCAL codes using the tones Red T through Red 9 as given in Table 8.3-1 shall only be assigned to SELCAL-equipped aircraft with the capability of receiving these tones.

— END —

- i. **Separability Clause.** - If, for any reason, any provision of this Memorandum Circular is declared invalid or unconstitutional, the other part or parts thereof which are not affected thereby shall continue to be in full force and effect.
- ii. **Repealing Clause.** - All orders, rules, regulations and issuances, or parts thereof which are inconsistent with this Memorandum Circular are hereby repealed, superseded or modified accordingly.
- iii. **Determination of changes.** - To highlight the amendments and/or revisions in the Memorandum Circular, the deleted text shall be shown with strikethrough and the new inserted text shall be highlighted with grey shading, as illustrated below:
  1. Text deleted: ~~Text to be deleted is shown with a line through it.~~
  2. New text inserted: New text is highlighted with grey shading.
  3. New text replacing existing text: ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.
- iv. **Effectivity Clause.** - This Memorandum Circular shall take effect after fifteen (15) days following the completion of the publication in a requisite single newspaper of general circulation or the Official Gazette and a copy filed with the U.P. Law Center - Office of the National Administrative Register.

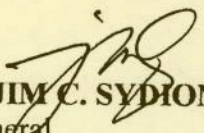


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
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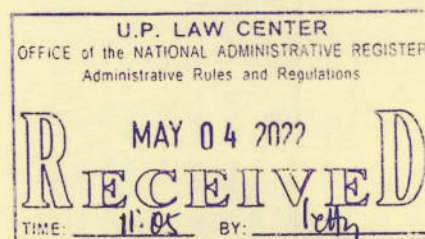
MADONNA L. OROCIO  
Records Officer II  
Central Records and Archives Division

So Ordered. Signed this 5<sup>th</sup> day of April 2022, at the Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Metro Manila, 1301.

  
**CAPTAIN JIM C. SYDIONGCO**  
Director General

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ADOPTION OF AMENDMENT 91 OF ICAO ANNEX 10 VOLUME III PART 2 TO PHILIPPINE CIVIL AVIATION REGULATIONS – AIR NAVIGATION SERVICES (CAR-ANS) PART 8 AERONAUTICAL TELECOMMUNICATIONS GOVERNING VOICE COMMUNICATION SYSTEMS