MEMORANDUM CIRCULAR
NO. 14-11-82

Subject: Implementation of the Revised Amateur Regulations

I. BASIS AND PURPOSE

The procedures and guidelines as set forth in this Circular are issued for the effective implementation of the provision of Ministry Circular No. 82-077 dated 20 October 1982, promulgated by the Ministry of Transportation and Communications as the revised Regulations governing the Amateur Radio Service.

II. GENERAL MECHANICS

1. Accreditation of Amateur Organizations

1.1 An amateur association, club or society shall submit to the Commission the following requirements to qualify for the issuance of a certificate of accreditation:

- Application for Certificate of Accreditation
- A copy each of SEC certificate of registration and Articles of Incorporation.
- A list of its members.
- A duly certified list of its board members and officers.

1.2 The duly accredited amateur association, club or society shall sign a memorandum of agreement with the Commission for the management and supervision of its members in the proper use of the amateur frequency bands and prevention of harmful interference.

2. Call Signs for Amateurs

2.1 Formation of call sign – The call signs of amateur stations shall be formed by the prefix DU for class A, DV for class B, DW for class C, DX or DZ for a club station or a station installed to be operated for a field trip or special event, followed by a figure corresponding to the Amateur Radio district where the station is located and a suffix of not more than three letters, e.g., DUICSC, DVIRA, DWISJ, etc.

2.2 Use of call sign – All transmission in the amateur radio service shall carry identification signals. The call sign must be transmitted at the start and end of each transmission and as frequently as practicable during the course of transmission, including those made for test, adjustments or experiments.

2.3 Posting of call sign – The call sign of a fixed amateur station with characters at least 10 cm high shall be posted at the entrance to the premises where the fixed station is located. In the case of a mobile station, the call sign with characters at least 5.08 cm high shall be posted on the windshield of a vehicle or vessel and 0.635 cm high on the equipment itself of a portable station.

3. Any amateur desiring to operate his radio station for a special field trip DX-expedition shall submit a written request to the NTC to obtain a temporary permit to operate the station for the duration of the event.

4. Amateur Examination

4.1 Required Elements for each class of Amateurs

Class A: Element I, VIII, IX, and X

Class B: Element I, II, III, IV, V, VI, and VII

Class C: Element I, II, III, and IV

4.1.1 A qualified person shall be allowed to take the examination for class B Amateur immediately after having passed the elements prescribed for class C.

4.1.2 However, a class C Amateur desiring to upgrade his license to class B shall not be require to be examined again on elements prescribed for class C Amateur, except Element I.

4.1.3 A class B Amateur shall be allowed to take the examination for class A provided he has been a holder of a valid class B station license for at least one (1) year before the data of filing the application for examination.

4.2 Examination Syllabus – The written examinations shall be composed of questions derived from the topics listed under the prescribed elements. The syllabi for the elements (not exclusive) are as follows:

4.2.1 Element II – Radio Rules and Regulations

1. Policies governing the use of Amateur Frequency Bands
2. Definitions of Terms
3. Applications, Permits and Licenses
4. Authorized power and frequency band
5. Classes of Amateur
6. Qualification of Amateur
7. Rules governing operation of amateur stations
8. Amateur organizations, accreditation, privileges
9. Suspension/revocation of licenses
10. Penalty provisions

4.2.2 Element III – Electrical and Electronics Principles

Concepts:

1. Reactive Power
2. Series and parallel resonance
3. Skin Effect
4. Fields, energy storage, electrostatic, electromagnetic
5. Photoconductive effect
6. Exponential charge/discharge
7. Impedance
8. Resistance
9. Reactance
10. Inductance
11. Capacitance
12. Impedance matching
13. Voltage
14. Alternating current, direct current
15. Conductor, Insulator
16. Open circuit, short circuit
17. Energy, power
18. Frequency, wavelength
19. Radio frequency
20. Audio frequency

Mathematical relationships; calculations:

21. Resonant frequency, bandwidth and "Q" of R-L-C circuit given component values
22. Phase angle between voltage and current, given resistance and reactance
23. Power factor, given phase angle

24. Effective radiated power, given system gains and losses
25. Replacement of voltage sources and resistive voltage divided with equivalent circuit consisting of a voltage source and are resistor (and application of Thevenins Theorem, used to predict the current supplied by a voltage divider to a known load)
26. Time constant for R-C and R-L circuits (including circuits with more than one resistor, capacitor or inductor)
27. Impedance diagram, basis principles of Smith Chart
28. Impedance of R-L-C networks at a Specified Frequency
29. Algebraic operations using complex numbers: real imaginary magnitude, angle
30. Ohm's Law
31. Current and voltage dividers
32. Electrical power calculations
33. Series and parallel combinations; of resistors, of capacitors of inductors
34. Turns ratio; voltage, current, and impedance transformation
35. Root mean square value of a sine wave alternating current

Electrical Units:

36. Ohm
37. Microfarad, picofarad
38. Henry, Millihenry, Microhenry
39. Decibel
40. Volt
41. Ampere
42. Watt
43. Hertz
44. Metric prefixes: mega, kilo, centi, milli, pico

4.2.3 Element IV – Amateur Radio Practice

Use of test equipment

1. Frequency measurement devices
2. Grid-dip meter; solid state dip meter
3. Performance limitations of oscilloscopes, meters, frequency counters; accuracy, frequency response, stability

4. Spectrum analyzer; interpret display; display of transmitter, output spectrum, such as commonly found in new product review articles in Amateur Radio magazines
5. Logic probe, indication of high or low state, pulsing state
6. Oscilloscope
7. Multimeter
8. Signal Generators
9. Signal tracer

Electromagnetic compatibility:

10. Intermodulation interference
11. Receive desensitizing
12. Cross-modulation interference
13. Capture effect
14. Vehicle-noise suppression ignition noise, alternator whine, static
15. Direction-finding techniques; methods for location of source of radio signals
16. Disturbance in consumer electronic products caused by audio rectification
17. Overload of consumer electronic products by strong radio frequency fields

Safety Precautions:

18. Household supply and electrical wiring safety
19. Dangerous voltage in equipment
20. Measures to prevent use of Amateur Radio station equipment by unauthorized persons
21. Lightning protection for antenna system
22. Ground system
23. Antenna-installation safety procedures

Transmitter performance:

24. Two-tone test
25. Neutralizing final amplifier
26. Power measurement

Proper use of the following station components and accessories

27. Reflectometer (VSWR meter)

28. Speech processor – rf and af
29. Electronic T-R switch
30. Antenna-tuning unit; matching network
31. Monitoring oscilloscope
32. Non-radiating load; "dummy" antenna
33. Field strength meter S-meter
34. Wattmeter

Interpretation of SWR readings as related to faults in antenna system;

35. Interference TO consumer electronic products caused by radiated harmonics.
36. Acceptable readings
37. Possible causes of unacceptable readings

4.2.4 Element VI – Signals and Emissions

1. Emission types A4, A5, F4, F5
2. Modulation methods
3. Deviation ratio
4. Modulation index
5. Electromagnetic radiation
6. Wave polarization
7. Sine, square, sawtooth waveforms
8. Root-mean-square value
9. Peak-envelope power relative to average
10. Resistors
11. Capacitors
12. Inductors
13. Transformers
14. Power-supply-type diode rectifiers
15. Quartz crystals
16. Meters (D'Arsonal movement)
17. Vacuum tubes
18. Fuses

4.2.6 Element VII – Operating Procedures

1. Facsimile transmission
2. Slow-scan television transmission
3. Use of Amateur Radio satellite
4. Amateur fast-scan television
5. Radiotelephony
6. Radio teleprinting

7. Use of repeaters
8. VOX transmitter control
9. Full break in telegraphy
10. Operating courtesy
11. Antenna orientation
12. International communication
13. Emergency-preparedness
14. R-S-T signal reporting system
15. Choice of telegraphy speed
16. Zero-beating received signal
17. Transmitter tune-up procedure
18. Use of common and internationally recognized telegraphy abbreviations including: CQ, K, SK, R, AR, 73, QRS, QRZ, QTH, QRM, QRN, QRA

4.2.7 Element VIII – Practical Circuits

1. Voltage regulator circuits; discrete and integrated
2. Amplifier; Class A, AB, B, C; characteristics of each type
3. Impedance-matching networks: PI, L, PI-L
4. Filters; constant K, M-derived, bandstop, notch, modern-network-theory, P1-section, T-section, L-section (not necessary to memorize design and equations); know general description, characteristics, responses and applications of these filters.
5. Oscillators; various types and their applications stability
6. Digital logic circuits; flip-flop, multi-vibrator, AND/OR/NAND/MOR/gates
7. Digital frequency divider circuits; crystal marker, counters
8. Active Audio Filters using integrated operational amplifiers
9. Power supplies
10. High-pass, low-pass and band-pass filters
11. Block diagrams showing the stages in complete am, ssb, and fm transmitters and receivers

Transmitter and receiver circuits – know purpose of each and how; basically, each functions:

12. Modulators; a-m, fm, balanced
13. Transmitter final amplifiers
14. Detectors, mixers stages

High-performance receiver characteristics:

15. Noise figure, sensitivity
16. Selectivity
17. Dynamic range

Calculation of voltages, currents and power in common Amateur Radio oriented circuits

18. Common Xmitter class A transistor amplifier; bias network signal gain
19. Common collector class A transistor amplifier, bias network, signal gain input and output impedances
20. Integrated operational amplifier voltage gain, frequency response
21. FET common-source amplifiers input impedance

Circuit design selection of circuit component values:

22. Voltage regulator with pass transistor and zener diode produce given output voltage
23. Select coil and capacitor to reasonate given frequency
24. LC preselector with fixed and variable capacitors to tune a given frequency range
25. Single-stage amplifier to have desired frequency response by proper selection of bypass and coupling capacitors

Block diagrams:

26. The stages in a simple telegraphy (AI transmitter)
27. The stages in a simple receiver capable of telegraphy (A1 reception)
28. The functional layout of novice station equipment, including transmitter, receiver, antenna switching, antenna feedline antenna, and telegraphy kay

4.2.8 Element IX – Antennas and Feedlines

1. Antenna gain, beamwidth
2. Trap antennas
3. Parasitic elements
4. Radiation resistance
5. Driven elements
6. Efficiency of antenna

7. Folded, multiple wire dipales
8. Velocity factor
9. Electrical length of a feedline
10. Voltage and current nodes
11. Mobile antennas
12. Loading coil, base, center, top

Antennas and Feedline

13. Antennas for space radio communications; gains; beamwidth, tracking
14. Isotropic radiator; use as a standard of comparison
15. Phased vertical antennas; resultant patters, spacing in wavelengths
16. Phombic antennas; advantages, disadvantages
17. Matching antennas to feedline; delta, gamma, stub
18. Properties of 1/8, ¼, ½, and 3/8 wavelength sections of feedlines; shorted, open

Necessary physical dimensions of high-frequency antennas for resonance on Amateur Radio frequencies

19. A half-wave dipole
20. A quarter-wave vertical

Common types of feedlines used at Amateur Radio stations:

21. Coaxial cable
22. Parallel-conductor line

4.2.9 Element X – Radio Wave Propagation

1. Sparadic – E
2. Selective Fading
3. Autoral Propagation
4. Radio-path horizon
5. Meteor Burst
6. Ground conductivity
7. Trans-equatorial
8. Ionospheric layers
9. Absorption
10. Maximum usable frequency
11. Regular daily variations
12. Sudden ionospheric disturbance
13. Scatter propagation

14. Sunspot cycle
15. Line-of-sight
16. Ducting, tropospheric bonding
17. Sky wave "ship"
18. Ground wave

5. Radio Amateur shall operate only in accordance with the class of station license issued to them with the sub-allocated frequency bands and the types of emission as indicated in Annex C.

6. License Form – the form of the Amateur Radio License to be issued to the Amateurs shall be shown in Annex B.

7. Requirements for issuance of an Amateur Station License

7.1 Certified copy of NTC report of rating the examination taken

7.2 Application for new station license

7.3 Application for permit to purchase/possess transmitter(s) transceiver(s)

7.4 Properly accomplished information sheet

III. SCHEDULE OF FEES

The following fees shall be paid to the NTC:

1. New or renewal amateur radio license

Class "A"	----------	P 20.00 per year or a fraction thereof
Class "B"	----------	P 25.00 per year or a fraction thereof
Class "C"	----------	P 30.00 per year or a fraction thereof

2.	Issuance of duplicate license	----------	P 10.00
3.	Examination for Amateur radio operator	----------	P 10.00
4.	Modification of station license	----------	P 10.00
5.	Permit to Purchase, Possess or Sell a Transmitter/Transceiver	----------	P 10.00

V. REPEALING CLAUSE – This Circular supersedes other NTC Circulars or instructions or part thereof that are inconsistent herewith.

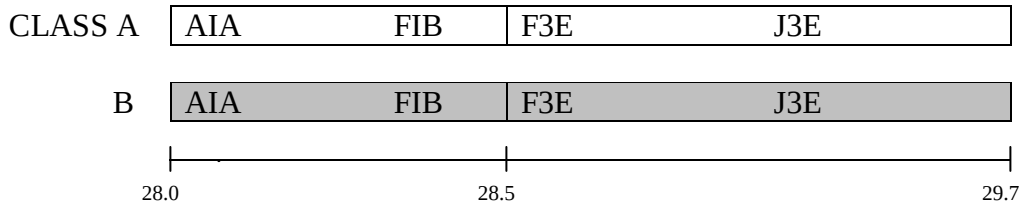
V. EFFECTIVITY – This Circular shall take effect immediately after the subject Ministry Order becomes operational.

CEFERINO S. CARREON
Acting Commissioner

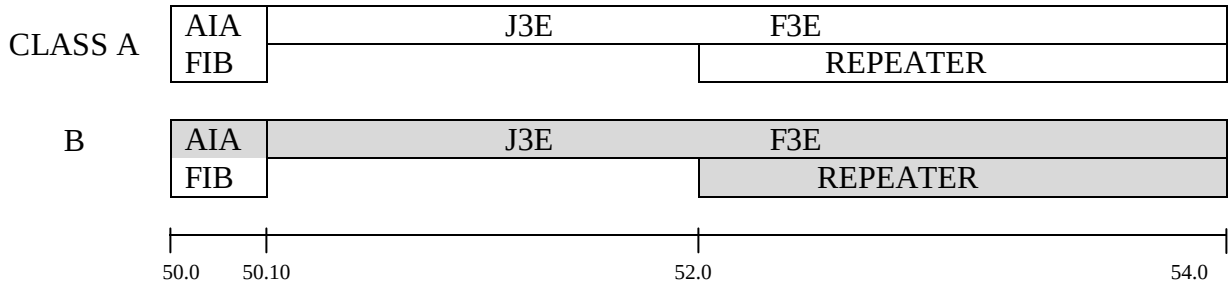
APPROVED:

JOSE P. DANS, JR.
Minister

10 METER BAND



6 METER BAND



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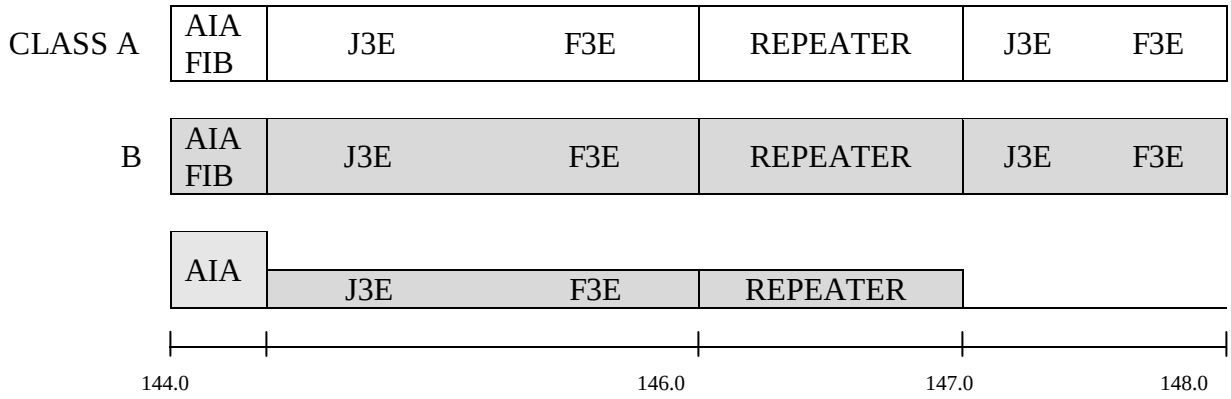

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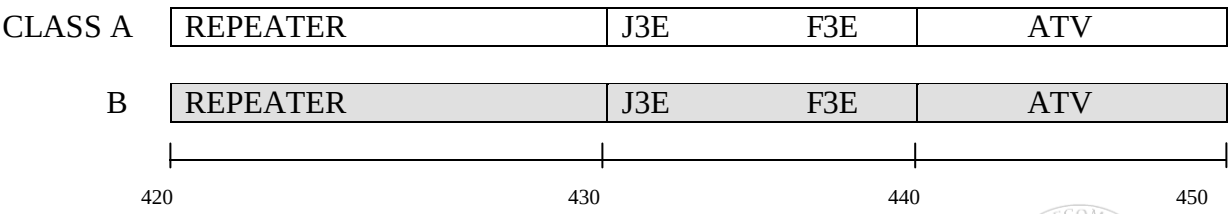

ANNEX B

Attached !" X 1" I.D. Picture	Republic of the Philippines Ministry of Transportation and Communications NATIONAL TELECOMMUNICATIONS COMMISSION Metro Manila

AMATEUR RADIO LICENSE NO.	NON-TRANSFERABLE
Effective Date: Expiration Date:	Call Sign: Operator Privileged: Class
NAME: ADDRESS: I hereby willingly agree to comply with all the existing regulations governing radio amateurs. _____ (Licensee's Signature)	This license is subject to the conditions stipulated under Ministry Order No. _____ dated _____ 1982. _____ Commissioner
Authorized Equipment:	Location of Station:

NTC Form No. _____

ANNEX C

PRESCRIBED AMATEUR FREQUENCY BANDS AND ALLOWABLE TYPES OF EMISSION

FREQUENCY BANDS FOR CLASS A			***TYPES OF EMISSION***		***FREQUENCY BANDS FOR CLASS B***			***TYPES OF EMISSION***		***FREQUENCY BANDS FOR CLASS C***			***TYPES OF EMISSION***
1.800	-	1.900	AIA	F1B	-			-		-			-
1.900	-	2.000	J3E		-			-		-			-
3.500	-	3.775	AIA	F1B	3.500	-	3.775	A1A	F1B	-			-
3.775	-	3.900	J3E		3.775	-	3.900	J3E		-			
7.000	-	7.025	A1A	F1B	7.000	-	7.025	A1A	F1B	7.000	-	7.025	A1A
7.025	-	7.100	J3E		7.025	-	7.100	J3E		7.025	-	7.100	J3E
10.100	-	10.110	A1A	F1B	10.100	-	10.110	A1A	F1B	-			-
10.110	-	10.150	J3E		10.110	-	10.150	J3E		-			-
14.000	-	14.100	A1A	F1B	14.000	-	14.100	A1A	F1B	-			-
14.100	-	14.350	J3E		14.275	-	14.350	J3E		-			-
21.000	-	21.100	A1A	F1B	21.000	-	21.100	A1A	F1B	-			-
21.100	-	21.450	J3E		21.100	-	21.450	J3E		-			-
28.000	-	28.500	A1A	F1B	28.000	-	28.500	A1A	F1B	-			-
28.500	-	29.700	J3E	F3E	28.500	-	29.700	J3E	F3E	-			-
50.000	-	50.100	A1A	F1B	50.000	-	50.100	A1A	F1B	-			-
50.100	-	53.000	J3E	F3E	50.100	-	53.000	J3E	F3E	-			-
53.000	-	54.000	REPEATER		53.000	-	54.000	REPEATER		-			-
144.00	-	144.100	A1A	F1B	144.000	-	144.100	A1A	F1B	144.000	-	144.100	A1A
144.100	-	146.000	J3E	F3E	144.100	-	146.000	J3E	F3E	144.100	-	146.000	J3E F
146.000	-	147.000	REPEATER		146.000	-	147.000	REPEATER		146.000	-	147.000	REPEATER
147.000	-	148.000	J3E	F3E	147.000	-	148.000	J3E	F3E	-			-
420.000	-	430.000	REPEATER		420.000	-	430.000	REPEATER		-			-
430.000	-	440.000	J3E	F3E	430.000	-	440.000	J3E	F3E	-			-
440.000	-	450.000	A T V		440.000	-	450.000	A T V		-			-

NOTE:

a) No station shall operate on the edge of any band
b) Operation in the 30 meter band is from 7:00 P.M. to 6:00 A.M. only
c) Graphic illustration on the assigned frequency band is shown in Annex A
d) See Annex D for the description of types of emission

ANNEX D

DESIGNATION OF EMISSION

OLD	NEW	DESCRIPTION
A1	A1A	TELEGRAPHY, WITHOUT THE USE OF MODULATING AUDIO FREQUENCY (BY ON-OFF KEYING) FOR AURAL RECEPTION
A3J	J3E	TELEPHONY, SINGLE SIDEBAND, SUPPRESSED CARRIER
F1	F1B	TELEGRAPHY, BY FREQUENCY SHIFT KEYING WITHOUT THE USE OF A MODULATING AUDIO FREQUENCY; ONE OF TWO FREQUENCIES BEING EMITTED AT ANY INSTANT FOR AUTOMATIC RECEPTION
F3	F3E	TELEPHONY, BY DIRECT FREQUENCY MODULATION OF CARRIER