MEMORANDUM CIRCULAR
NO. 02-03-87

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. 87-174 dated 03 February 1987, 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 the following requirements to qualify for the issuance of a certificate of accreditation:
    - Application for Certificate of Accreditation
    - A copy of each 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 classes A, B, & C, DY for class D, DX or DZ for club station or station installed to be operated for a field trip or a special event followed by a figure corresponding to the amateur radio district where the station is located and a suffix of not more than 3 letters. However, class A shall be given only one option to change the prefix of his call sign to 4D to 4F, all other prefix shall be reserved for further assignment.

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 tests, 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 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 or 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
Class D	:	Element 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 Amateur.

4.1.2 However, a class C amateur desiring to upgrade his license to class B shall not be required 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 date of filing the application for examination.

4.1.4 Class “D”

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
2. Definition of Terms
3. Applications, Permits and licenses
4. Authorized power and frequency band
5. Classes of Amateurs
6. Qualifications of Amateurs
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 reasonance
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. Reasonant 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 one resistor (and application of Thevenin's 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, Milihenry, Microhenry
39. Decibel
40. Volt
41. Ampere
42. Watt
43. Hertz
44. Metric, prefixes, mega, kilo, centi, milli, micro, 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 by strong audio rectification
17. Overload of consumer electronic products by strong radio frequency fields
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 V – 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. Signal-to-noise ratio
11. Amateur frequency bands
12. Pulse modulation; position; width
13. Digital signals
14. Narrow-band voice modulation
15. Information rate vs bandwidth
16. Peak amplitude of a signal
17. Peak-to-peak values of a signal
18. Emission types
19. Signal, information
20. Amplitude modulation
21. Double sideband
22. Single sideband
23. Frequency modulation
24. Phase modulation
25. Carrier
26. Sidebands
27. Bandwidth
28. Envelope
29. Deviation
30. Overmodulation
31. Splatter
32. Frequency translation; mixing multiplication
33. Radioteleprinting audio frequency shift keying, mark, space, shift
34. Emission type A1, A3, F1, F3

Cause and core:

35. Backwave
36. Key clicks
37. Chirp
38. Superimposed hum
39. Undesirable harmonic emissions
40. Spurious emissions

4.2.5 Element VI – Circuit Components:

Physical appearance, types, characteristics, applications and schematic symbols for the following:

1. Diodes, zener, tunnel, varactor, hot-carrier, junction, point contact, PIN
2. Transistors, npn, pnp, junction, uni-junction, power, germanium, silicon
3. Silicon-controlled rectifier, triac
4. Light-emitting diode, neon lamp
5. Field-effect transistors; enhancement, depletion, MOS, CMOS, n-channel, p-channel
6. Operational amplifier and phase-locked loop integrated circuits
7. 7400 series TTL digital integrated circuits
8. 4000 series CMOS digital integrated circuits
9. Vidicon, cathode ray tube
10. Resistors
11. Capacitors
12. Inductors
13. Transformers
14. Power-supply-type diode rectifiers
15. Quarts 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, DE, K, SK, R, AR, 73, QRS, QRZ, QTH, QSE, 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/HOR/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 a-m, ssb, how, basically, each functions:

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 emitter 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 amplifier; input impedance

Circuit design; selection of circuit component values:

22. Voltage regulator with pass transistor and zener diode to produce given output voltage
23. Select coil and capacitor to reasonate at 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 (A1) 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, and telegraph key

4.2.8 Element IX – Antennas and Feedlines

1. Antenna gain, beamwidth
2. Trap antenna
3. Parasitic elements
4. Radiation resistance
5. Driven elements
6. Efficiency of antenna
7. Folded, multiple wire dipoles
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 Feedlines:

13. Antennas for space radio communications, gains, beamwidth, tracking
14. Isotropic radiator; use as a standard of comparison
15. Phased vertical antennas, resultant patterns, spacing in wavelengths
16. Rhombic 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 reasonance 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. Sporadic – E
2. Selective Fading
3. Auroral Propagation
4. Radio-path horizon
5. Ground conductivity
6. Meteor Burst
7. Trans-equatorial
8. Ionosperic layers
9. Absorption
10. Maximum usable frequency
11. Regular daily variations
12. Sudden ionospheric disturbance
13. Scatter propagation
14. Sunspot cycle
15. Line-of-spot
16. Ducting, troposperic bonding
17. Sky wave “skip”
18. Ground wave

5. Radio Amateurs 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 in 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

   7.5 Certificate of membership from an amateur club registered and accredited by NTC and affiliated with PARA.

III. SCHEDULE OF FEES

The following shall be paid to the NTC:

1. New or renewal amateur radio license

Class "A"	-	P 50.00 per year or a fraction thereof
Class "B"	-	P 55.00 per year or a fraction thereof
Class "C"	-	P 60.00 per year or a fraction thereof
Class "D"	-	P 65.00 per year or a fraction thereof

2. Issuance of duplicate license …….. P 50.00

3. Examination for Amateur radio operator

Class A	……	P 50.00
Class B	……..……..	P 50.00
Class C	……..……..	P 50.00
Class D	…….	P 50.00

4. Modification of station license ……..…….. P 20.00

5. Permit to Purchase ……. P 20.00/unit
   Possess ……. P 45.00/unit
   Modification Fee …… P 20.00

Application for

Duplicate RSL			……...……..	P 50.00
RSL	-	A	…….	P 100.00
		B	…….	P 105.00
		C	…….	P 110.00
		D	…….	P 115.00

6. Operator Certificate

A	……..……..……	P 55.00
B	…….	P 45.00
C	…….	P 35.00
D	…….	P 35.00

7. Note: Inspection Fee is P 50.00 to all Classes.

8. Surcharges:

1 day to 180 days	-	50%
181 days to 363 days	-	100%

IV. REPEALING CLAUSE

This Circular supersedes other NTC Circulars instructions or part thereof that are inconsistent herewith.

V. EFFECTIVITY

This Circular shall take effect immediately upon approval.

(Sgd.) ROSAURO V. SIBAL
Commissioner