Republic of the Philippines
NATIONAL POLICE COMMISSION
NATIONAL HEADQUARTERS, PHILIPPINE NATIONAL POLICE
OFFICE OF THE CHIEF PNP
Camp BGen Rafael T Crame Quezon City

29 JAN 2021

MEMORANDUM CIRCULAR
NO.: 2021 - 016

GUIDELINES AND PROCEDURES IN THE CONDUCT OF BASIC FUNCTIONALITY TEST OF DIGITAL MOBILE RADIO

1. **REFERENCES:**
   a. PNP ICT Master Plan (Secured, Mobile, Artificial Intelligence-Driven, Real Time Technology) Policing, and

   b. Program thrusts as stated in the Revised DICTM Action Plan for 2019.

2. **RATIONALE:**

The Philippine National Police (PNP) had recently migrated from the Analog Multi-Trunked Radio System used for more than two decades to Digital Trunked Radio System adopting the Digital Mobile Radio (DMR) Standard. This is to keep up with the latest development in technology as well as to harness the benefits brought about by digital technologies. To ensure the soundness of the DMR project, random functionality tests are conducted on selected police offices/units to test whether the services of the project are delivered as promised. These guidelines provide the step by step procedure in the conduct of such test which may be carried out by personnel who have limited technical knowledge about radio communications.

3. **SITUATION:**

The PNP has started the nationwide deployment of digital radio system. This is intended to replace the old analog radios that the organization has been using for the longest time now. To ensure its effectiveness as the primary means of communication for all its units on the ground, random functionality checks must be conducted. However, there is no prescribed procedure as to how the test is to be carried out.

4. **PURPOSE:**

This MC prescribes the guidelines and procedures to be undertaken in the conduct of basic functionality test on communications equipment particularly DMR, during inspection, validation, and inventory of DMR network and terminals.

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This does not replace the Test and Evaluation Procedures being conducted by the Directorate for Research and Development during procurement. It applies only to PNP-owned DMR equipment.

5. **DEFINITION OF TERMS**:

a. Base Radio – is a radio transceiver usually installed in police stations. Its antenna is installed outside the building to enable long distance transmissions and reception of radio signals. It is powered by an Alternating Current (AC) source using a power supply with a 12 Vdc output and is also equipped with a handset having a Push To Talk (PTT) button.

b. Base Station - is a station at a specified site authorized to communicate with mobile stations

c. Call sign -. refers to any combination of characters or pronounceable words that identifies a communication facility, a command, an authority, an activity, or a unit; used primarily for establishing and maintaining communications.

d. Conventional Repeater - is a radio system that operates on fixed RF channels.

e. Digital Mobile Radio (DMR) - An open standard for digital radio technology set by the European Telecommunications Standard Institute (ETSI) to provide low and cost -effective radio solution for professional users.

f. Dispatch Console – is a system that interfaces to a private or public radio system, allowing the dispatcher to communicate directly with all deployed police officers in the field.

g. Handheld Radio - is a radio transceiver with an antenna and a battery pack in a single package, sometimes called the portable radio. This is the basic radio communications equipment of a police officer when conducting official duties in the field.

h. LED – is a light-emitting diode (LED) a semiconductor light source that emits light when current flows through it.

i. Receiver - is a part of communications equipment designed to respond to electromagnetic energy.

j. Regulated Power Supply - is an electrical device that converts unregulated AC into a constant Direct Current (DC) through a rectifier circuit. Its function is to supply a stable voltage to a circuit or device that must be operated within certain power supply limits.

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k. Repeater - is a combination of apparatus for receiving Radio Frequency (RF) communication signals and automatically retransmitting corresponding signals on different frequencies.

l. Terminal Unit - refers to either handheld, mobile or base radio.

m. Transceiver - is an inherent combination of a radio transmitter and receiver.

n. Transmitter – refers to part of communications equipment capable of emitting radio frequency waves or energy intended for transmission of signals, messages, or intelligence.

6. **GUIDELINES:**

a. **General Guidelines:**

1) **Basic functionality test for terminal units (Handheld Radios)**

a) Rotate the volume knob clockwise until a soft clicking sound is heard. That will turn on the radio. Rotate the knob some more to increase the volume;

b) Observe the battery indicator of the unit you are about to test located at the upper right corner of the screen. The unit must be fully charged before the conduct of any test;

c) Once the radio is turned on the LED display will turn on and you will see on screen the network you are in and the identification of the radio. Observe the signal strength indicator in the left-hand corner of the screen. You should also see a green light by the volume knob slowly flashing. The mode of operation is also displayed on the screen. DMR radios have several modes of operation. The table below lists the different modes with their corresponding icons that you would see on the screen;

ICON	Radio Status
DM	Direct Mode: The radio operates in a conventional mode and transmits and receives directly from the other terminal without relaying the signal to a repeater.
RM	Repeater Mode: The radio operates in a conventional mode and transmits and receives directly through a repeater.
TM-DW	Trunking Mode - Digital Wide: The radio operates in trunking mode and registers with multiple Base Stations (BS) connected through the network.
TM-DL	Trunking Mode - Digital Local: The radio operates in trunking mode and registers with single BS.
Ⓐ	The Mode Automatic Switch feature is enabled.

d) Press the PTT button located at the left-hand side of the unit across the screen. You should hear a beep sound indicating that you may speak. Place the unit about one to two inches from your mouth;

e) With a moderate voice, use call sign to call the party you want to contact and then identify yourself as the caller and say "Over";

f) Release the PTT button. A beeping sound indicates that the call is dropped;

g) Wait for at least four seconds to give way to the party being called to respond;

h) The called party will respond 'Go ahead";

i) Repeat this procedure and continue with the radio contact;

j) To end the conversation say "Over and Out"; and

k) The radio contact was established, hence the terminal is functional.

2) **Basic functionality test for Mobile Radios**

a) Push the knob to turn on the radio. If the unit under test draws power from a car battery, it must have sufficient supply of power during the conduct of the test. Rotate the knob some more to increase the volume;

b) Once the radio is turned on, the LED display will turn on and you will see on screen the network you are in and the identification of the radio. Observe the signal strength indicator in the left-hand corner of the screen. You should also see a green light by the volume knob slowly flashing;

c) Press the PTT button located at the side of the speaker microphone. You should hear a beeping sound indicating that you may speak. Place the unit about one to two inches from your mouth;

d) With a moderate voice, use call sign to call the party you want to contact and then identify yourself as the caller and say "Over";

e) Release the PTT button. A beeping sound indicates that the call is dropped;

f) Wait for at least four seconds to give way to the party being called to respond;

g) The called party will response "Go ahead";

h) Repeat procedure and continue with the radio contact;

i) To end the conversation, say "Over and Out"; and

j) The radio contact was established, hence the terminal is functional.

3) **Basic functionality test for Base Radios**

a) Base radios draw their power from a regulated power supply. Make sure that the unit under test draws its power from the prescribed regulated power supply;

b) Rotate the volume knob clockwise until a soft clicking sound is heard. That will turn on the radio. Rotate the knob some more to increase the volume;

c) Once the radio is turned on the LED display will turn on and you will see on screen the network you are in and the identification of the radio. Observe the signal strength indicator in the left-hand corner of the screen. You should also see a green light by the volume knob slowly flashing;

d) Press the PTT button located at the side of the speaker microphone. You should hear a beep sound indicating that you may speak. Place the unit about one to two inches from your mouth;

e) With a moderate voice, call the party you want to contact and then identify yourself as the caller and say "Over";

f) Release the PTT button. A beeping sound indicates that the call is dropped;

g) Wait for at least four seconds to give way to the party being called to respond;

h) The called party will respond "Go ahead";

i) Repeat procedure and continue with the radio contact;

j) To end the conversation, say "Over and Out"; and

k) The radio contact was established, hence the terminal is functional.

4) **Basic functionality test for DMR Conventional Repeater Network**

a) Conduct radio check on selected deployed patrol units, beat patrol and other units covered by the DMR Conventional Repeater Network. This should be done at the Tactical

Operations Center (TOC) with the assistance of radio operator using the installed Conventional Smart Dispatch Console.

b) Monitoring units must acknowledge one by one. Observe the clarity of voice reception and called party location. Listen for any noticeable background noise

c) Log in to the Smart Dispatch Console. Username and password are being kept by the authorized user.

d) On the screen, user will see the Hytera Smart Dispatch user interface.

d.1) Dispatch - in this section, user must be able to see the list of subscribers registered in the system;

Selecting a subscriber/group to be called:
Double click a registered radio subscriber/group. A voice box shall pop up. By pressing the PTT icon, the user should be able to transmit voice and call a specific radio user/group in the field. Press the PTT icon again to drop the call;

d.2) GPS - in this section, user must be able to see the locations of the registered subscribers on the fleet-map. Select a radio icon and right click to see the subscriber ID and other details (e.g. GPS);

d.3) Message – in this section, user will be able to send a group and/or private (individual subscriber) message.
Selecting a group/private (individual subscriber) contact to receive a message:

Tick a registered radio group or private/individual subscriber. A message box shall appear on the right screen. Type the desired message (up to 255 characters) and then click the send icon;

d.4) Report --reports on the following queries can be seen in this section.

Call – Under search type, select call. Select Start time and End time. Click Search. The list of all calls made on the specific start and end time can be replayed. Select a caller and click play icon to replay calls;

Message -- Under search type, select message. Select Start time and End time. Click Search. The list of all messages made on the specific start and end time can be displayed. Select a message and click open icon to display its contents;

Geofencing alarm– Under search type, select geofencing alarm. Select Start time and End time. Click Search. The list of all alarms created on the specific start and end time will be displayed.

History track – Under search type, select history track. Select radio ID. Select Start time and End time. Click Search. The list of all tracks made by the selected radio ID on the specific start and end time can be replayed. Click play icon to replay history tracks, click stop icon to stop tracks;

5) **Text Messages**

Select Menu, then Messages New Message, then type your message. After typing your message, press Send. Choose Manual Dial and enter the radio ID number of your intended recipient. Instruct the recipient to text back to you to confirm that your message is received. This is possible only if you know the radio ID of the radio you are texting. You may choose Private Contact or Group Contact if you have these data saved in the radio.

6) **Global Positioning System (GPS)**

GPS signal is weak indoors. With your handheld radio on hand, go out of the building to receive GPS signal. Notice the letter **"G"** on the screen indicating that your unit is receiving GPS signal.

On the other hand, the location of handheld radios belonging to the network can be monitored by the TOC through the Dispatch Console. This console provides visual information on the location of the radios.

b. **Responsibilities**

1) **DICTM**
   a) OPR for the implementation of this MC;

   b) Review and update this MC to ensure that its contents are relevant to the needs of the PNP; and

   c) Perform other tasks as directed

2) **CES**
   a) Provide technical support to PNP offices/units in carrying out the functionality test on communications equipment;

   b) Direct and supervise the Regional Communications and Electronics Units in the implementation of this MC;

c) Provide technical assistance to the Communications Chiefs of National Support Units and Provincial Police Offices/City Police Offices/ Municipal Police Stations in the implementation of this MC; and

d) Perform other tasks as directed.

3) **RD, PROs and D, NSUs**

a) Ensure support and cooperation of all their respective concerned office/units in the implementation of this MC; and

b) Perform other tasks as directed.

7. **PENALTY CLAUSE:**

PNP personnel who violate any of the provisions of this MC shall be held administratively liable under NAPOLCOM MC No. 2016-002 as amended by NAPOLCOM MC No. 2019-005 or 2017 Rules on Administrative Cases in the Civil Service, whichever is applicable.

8. **REPEALING CLAUSE:**

Any MC and other existing guidelines and issuances inconsistent with this MC are hereby rescinded or modified accordingly.

9. **EFFECTIVITY:**

This MC shall take effect after 15 days from the filing of a copy thereof at the University of the Philippines Law Center in consonance with Section 3 Chapter 2, Book VII of Executive Order No. 292, otherwise known as the "Revised Administrative Code of 1987," as amended.

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Chief, PNP

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