



HEADQUARTERS PHILIPPINE COAST GUARD
(PUNUNGHIMPILAN TANODBAYBAYIN NG PILIPINAS.)
139 25th Street, Port Area
Manila

31 July 1996

CGAO/CG-10

STANDING OPERATING PROCEDURE
NUMBER.....12-96

UTILIZATION OF METEOR BURST LIGHTHOUSE MONITORING
CONTROL SYSTEM

I. PURPOSE:

To prescribed the procedure for proper Utilization of Meteor Burst System

II. OBJECTIVE:

To maximize the operational effectiveness and prolong the life service of Meteor Burst System.

III. SCOPE:

This SOP applies to all CG Districts and lightstations installed within Meteor Burst Monitoring System.

IV. GENERAL

- A.** Meteor Burst (MB) technology was first discovered in the 1950 by radio ham and radar operator. The greatest advances in MB technology came as a result of the satellite communication, which resulted in improvement to solid state device and microprocessors.
- B.** Meteor burst technology is long range and low cost data and message communication. It is based on the predictable reflection of radio waves by the billions of meteor entering the earth atmosphere every day. The technology is ideal where information must be transmitted over long distance from remote areas and is also well suited to operate in remote hostile environment.
- C.** The system uses highly efficient, low power, data acquisition and communication terminals. A basic Meteor Burst Monitoring System consists of a Master Station and a number of remote acquisition and/or communication terminal.

- D. Today Meteor Burst technology has a variety of application, and is utilized in the world. The Primary application of MB are data collection and message communication.
- E. In the Philippine, the Meteor Burst System is incorporated to the Maritime Safety Improvement Project-II which involves the construction of 110 new lightstations nationwide, purposely to continuously and remotely monitors the operational status of this lightstations.

V. **DEFINITION:**

- A. **Master Station** – is the heart of monitoring system, this serve as the processor, transmitter and line message. This is composed of a transmitter/receiver and a computer.
- B. **Slave Station** – is actually another master station but under the control master station. It serves areas which cannot be reached by master station.
- C. **Master Monitoring Station** – is where data from all remote stations are monitored. It includes Meteor Burst receiver/transmitter and computer.
- D. **District Monitoring Station** – is where data from stations within the whole Coast Guard District are monitored. It is includes Meteor Burst receiver/transmitter and computer.
- E. **Outstation** – is the lightstation itself to be monitored through the Meteor Burst Monitoring System.

VI. **PRINCIPLE OF OPERATION**

- A. The system is basically a wireless or remote data communication system pre-designated points. Unlike the satellite communication system, which employ a relay or satellite placed up there in the space. This Meteor Burst technology take advantage of the phenomenal occurrence of paths of meteorites in the ozone layer to its radio signals back to earth or to the recipient stations. Path of meteorites are ionized gas trails that last for a few milliseconds to a few minutes, depending on the size of the meteorite. The gas trail has the property to reflect radio signals down to earth. A properly placed meteorite trail will provide a suitable reflector or link of radio signal between the master station and remote stations.
- B. Normal data which are transmitted are usually of short duration, hence meteorite trails are suitable to serve as links to this mode of transmission. With the use of computer technology, the message can be sent to the desired stations continuously.
- C. The signal coming from master station is normally made up of two parts, probe and message signal, with a 40 to 50 megahertz radio/frequency. The probe signal searches for a link when is established then the message is sent and the remote station confirms the message through the same link. The whole process take between few seconds to a few minute depending on the availability of the meteor trails which vary from time to time. Whenever a message is cut due to insufficient time span of meteor trails, a probe signal is

then sent again to find other suitable links, and the message transmission can resume. It has a range of 2,000 kilometers.

D. For the PCG Districts , the system can be utilized in two way. First is to send ATON related message to CG10 and HANC and to received instructions/information coming from CG-10 and HANC. Second is to process informations received from lightstations. Once an information is received, say it Intruder Alarm, defective batteries, defective lamp the DANO should be able to respond within 24 hours. This is specially, so that vandalism is becoming prevalent in all the Districts. After the report has been verified, corrective measures should be done at their level and progressor update report should be sent to HANC/CG-10. CG Districts should see to it that this two function of the system is being done efficiency and effectively.

VII. OPERATING PROCEDURES:

The MB Monitoring shall be operated from 0600H to 1800H from Monday to Friday, and the following the procedures shall be followed;

A. Switching the Computer

- 1) Modem should be left an 24 hrs a day all data and messages will be stored in the modem until the CPU is switch off.
- 2) Switch on the Monitor
- 3) Switch on the CPU

B. Starting the Lighthouse Monitoring Control Program (LMC)

- 1) When switching procedure have been successfully completed:
 - (a) Use mouse to point the arrow on the LMC icon
 - (b) Double click on the left button of the mouse to open up and access to LMC program.

C. Running the LMC Program

- 1) Move your mouse pointing the arrow to the right side where the terminal is located and click the left button of the mouse once.
- 2) Type the word Test and press Enter
- 3) Line will appear indicating here in sync, ack the system is now communicating with 545A Modem.

D. Using the Menu Bar on the Screen.

Move the mouse pointing the arrow on bar on the screen and press on the left button of the mouse once.

1) File Menu

- a) **Send Message** – allow to send message to other station in the station by filling completely the box and pressing the OK box

- b) **Remote Command** – allow to send remote commands to other station in the system and also update a group or link on the Master Station when adding new remotes in the system.
- c) **Configure Port** – allow to configure the LMC to operate properly with the computer's serial port
- d) **Save Configuration** – entered the Correct Access Code the LMC will save the information you have entered or changed.

2) Database Menu

- a) **Data** – provide access to recently received data from lightstations
- b) **RMP** – view the performance parameter of remote lightstations.
- c) **Message** – view the message sent by district/lightstations from another station in the station in the system. This also allow to view past message
- d) **Alert** – allow to view the lightstation alert that have occurred. When an alert is received, the lighthouse icon will changed to the large red exclamation. It also generate a pop up box.

3) Visibility Menu

Show you the different District in selecting a district point arrow and click the mouse once, and only those lighthouse dedicated to that district are shown on t he Main screen.

4) Lighthouse Menu

- a) **New** – allow to define new lighthouse and all it parameter. Each light station has its own parameter depending on the classification, primary, secondary and tertiary in (Annex).
- b) **Edit** – Allow to change defined date on a selected lightstation.
- c) **Status-** Allow to view the current status of selected lightstation.
- d) **Find** – allow to select any lightstation and then zoom in to icon on main screen.

VIII. OTHER UTILIZATION:

To optimize the capability of the computer system the District are allowed to use the system for word processing However,only one word processing is allowed. The District can us MS Woreks or MS Word. All other program should be deleted in the system. Remember that the sole purpose of the MBS is for Lighthouse Monitoring and not for other function or activity.

IX. REPORTING SYSTEM:

- A. Reporting shall be at 0900H-1000H
- B. Status of LS
- C. Deficiencies noted
- D. Remarks

X. MAINTENANCE PROCEDURE:

A. For no response test command at Modem 545a follow the procedure:

- 1) Exit LMC program
- 2) Exit windows
- 3) Restart the computer
- 4) Enter LMC program
- 5) Type "Test" command
- 6) Upon completion of the above Procedure, 545A terminal should respond with following:
 - 1. Test, date, time
 - 2. Sync-xmit-pwr fwd-pwr-rev-vbat detrf
xxx zzz >100W >10v <5db
- 7) If procedure above does not solve the problem check the following
 - 1. Port Configuration of LMC Program
 - 2. Make sure that the Modem ports are assigned correctly to communicate with computer.

XI. RESPONSIBILITIES:

- A. District commander shall be responsible for effective utilization of Meteor Burst Lighthouse Monitoring Control System, Pursuant to this SOP.
- B. The DANO should be primarily accountable to the proper utilization of the system. Any failure due to improper use of the system specially the computer shall be accounted to the DANO.
- C. All malfunction with the system and unauthorized utilization of the system shall be reported to AC of S for Navigational safety (GG-10) for disposition

XII. EFFECTIVITY:

This SOP shall take effect upon publication.

BY COMMAND OF COMMODORE CAPADA

OFFICIAL:

**JOSE G GARCIA
Captain PN(GSC)
Chief of Staff, PCG**

**PEDRO V TINAMPAY
LT PN
Coast Guard Adjutant**