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EMERGENCY TELECOMMUNICATIONS PROCEDURES MANUAL

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PREFACE

This document is one of a series produced for CDERA by a team of regional consultants. The series comprises the following:

- **Standing Operating Procedures: Guidelines for National Emergency Operating Centres.**

- **Emergency Telecommunications Procedures Manual**

- **Guidelines for a National Disaster Telecommunications Plan**

The documents were produced as part of the Regional Emergency Telecommunications Review Project funded by the Canadian International Development Agency (CIDA).

The objectives of this project were:

- To develop and test regional emergency telecommunications plans

- To expose emergency managers, personnel from key response agencies, radio operators and national telecommunications officers to various elements of emergency operations procedures.

- To provide national disaster focal points with model Standard Operating Procedures and checklists from which national contingency plans can be formulated.

CONTENTS

GLOSSARY OF TERMS USED IN THIS DOCUMENT

CBERS	-	Citizen Band Users
CO	-	Communications Officer
HAMS	-	Amateur Radio Operators
HF	-	High Frequency Band (3 MHz - 30 MHz)
KHz	-	Kilo-Hertz or Thousand Cycles
MHz	-	Mega-Hertz or Million Cycles
NCCC	-	National Communications Control Center
NDC	-	National Disaster Coordinator
NDMAC	-	National Disaster Management Advisory Committee
NDO	-	National Disaster Organization
NEOC	-	National Emergency Operations Center
Propagation	-	Relates to how radio signals are transmitted and the properties that affect those transmissions
PTT	-	Push-To-Talk
Relay Mode	-	Relay of information to and from a 3rd Party
RSS	-	Regional Security System
TC	-	Telecommunications Coordinator
UHF	-	Ultra High Frequency Band (300 MHz - 3000 MHz)
VHF	-	Very High Frequency Band (30 MHz - 300 MHz)

INTRODUCTION

This manual is to provide guidelines for the establishment, operation and management of the **National Communications Control Center (NCCC)**.

The NCCC will have overall control for the emergency information services, and will work to support the objectives of the **National Emergency Operations Centre (NEOC)**.

The NEOC will be managed by a **National Disaster Coordinator** who will have the support of an **Advisory Committee**, (the National Disaster Management Advisory Committee, NDMAC), consisting of Executive and Operations Personnel from Disaster Related Organizations.

This Committee will have a designated **Telecommunications Coordinator** who will be responsible for ensuring the availability of telecommunications facilities required for necessary information transfer before, during and after an emergency.

Functions of the Committee will include, but shall not be limited to the following:-

1.   To ensure that a fully operational telecommunications system is in place at all times in order to respond to emergencies.

2.   To establish and maintain telecommunications networks which are necessary to support the national Emergency Response Plan.

3.   To manage and coordinate operational networks to facilitate the flow of information between critical agencies participating in the response.

The objectives will be documented in a **National Telecommunications Plan** which will be prepared and maintained by a **Telecommunications Sub-Committee** with the Telecommunications Coordinator as Chairman.

IMPLEMENTATION AND COORDINATION

The Telecommunications Sub-Committee will appoint a **Communications Officer (CO)** who will administer the day to day operation of the National Communications Control Center (NCCC) from where the National Telecommunication Plan will be coordinated.

The Communications Officer will be guided by the procedures and activities included in this manual.

The Communications Officer will report to the NEOC's **Operations Officer** in the absence of the Telecommunications Coordinator.

In smaller and less sophisticated NCCC's, the Communications Officer may also be responsible for actual message handling, in which case, he will be responsible for managing the NDO's network.

3.   NCCC OPERATING STATES

The NCCC will operate in one of four (4) clearly defined States:

(a)   Routine
(b)   Alert
(c)   Response
(d)   Recovery

3.1   Definitions

3.1.1 Routine State
The State in this Phase, relates to activities at the NCCC which take place during normal periods with an identified Communications Officer.

3.1.2 Alert State
A warning State due to an event associated with an imminent disaster. During this period, resources are put in a state of mobilization.

3.1.3 Response State
Activities carried out during (when possible), or as soon as possible after an event.

3.1.4 Recovery State
Activities carried out to support the longer term restoration process leading to normality.

3.2   Application

The following procedures and activities for each of the four States will apply to any NEOC as it currently exists. The initial procedure will depend on the type and extent of the emergency. The procedures, including relevant specifics, should be written for each NEOC and displayed in the NCCC.

3.2.1 Routine State

(A)   The following procedures must be carried out on a daily basis.

    (1)   Check NDO's radio network
        -   Call each station through the repeater
        -   Call each station on the simplex mode
        RECORD the following information
        (a)   Date and Time
        (b)   Organization
        (c)   Quality of transmission
        (d)   Remarks
        -   All non-responses must be investigated and remedial action taken.

    (2)   Check all other Network Radios located at NCCC.

The following procedures must be carried out on at least a weekly basis.

    (1)   Maintain required electrical characteristics of the NCCC in particular, and the NEOC in general. This will require the assistance of two other persons and a volunteer.

        -   With the assistance of other person(s), transmit on as many radios as possible simultaneously and check the NCCC's voltage. While the radios are transmitting, the line voltage should not drop more than 10% below normal. Refer to electrician if necessary.

    (2)   Check Emergency Generator and Battery Backup.

        -   Exercise under normal load conditions for at least 30 minutes.

        -   Check and restore fuel tank as required.

        -   Ensure the availability of the quantity of oil and filters required for two (2) oil changes.

    (3)   Check Radio Output Power

        -   Requires applicable wattmeter.
        Repair or adjust if necessary.
        -   Check all radios.

    (4)   Maintain a checklist (including comments) on all associated networks.

(5) Ensure that back up weather data facility at NCCC or elsewhere is operational.

- A hard copy of the data and/or picture must be held in a designated file.

(6) Maintain Emergency Information System and exercise radio link.

- Alternate stations may be used to check link and update its data.

(7) Generate a Telecommunication Network Report.

- Include information on NDO's and associated networks.

(8) Ensure that an adequate supply of message forms and logs are always available.

The following activities should be carried out at least once per month.

(1) Carry out physical inspections of antennas, antenna brackets, cable and connectors.

(2) Maintain an updated list of contact persons, their telephone numbers, radio call signs, organization post, function (in plan) and address.

(3) Maintain a library of manuals for equipment owned and operated by NDO.

- Records of checks and adjustments must be included.

(4) Maintain an updated inventory list of all equipment owned or held by the NDO

(5) Ensure that adequate waterproof materials are available to protect equipment if this becomes necessary.

3.2.2 Alert State

The following procedures from the Routine State must be carried out in the shortest possible time at the initiation of this state, (the Alert State).

FROM ROUTINE STATE:

(1)   Maintain required electrical characteristics of the NCCC in particular, and the NEOC in general. This will require the assistance of two other persons and a volunteer.

-        With the assistance of other person(s), transmit on as many radios as possible simultaneously and check the NCCC's voltage. While the radios are transmitting, the line voltage should not drop more than 10% below normal. Refer to electrician if necessary.

(2)   Check Radio Output Power
-        Requires applicable wattmeter.
         Repair or adjust if necessary.

-        Check all radios.

(3)   Check NDO's radio network
-        Call each station through the repeater

-        Call each station on the simplex mode

         RECORD the following information:
         (a)   Date and Time
         (b)   Organization
         (c)   Quality of transmission
         (d)   Remarks

-        All non-responses must be investigated and remedial action taken.

(4)   Ensure that an adequate supply of message forms and logs are always available.

(5)   Ensure that adequate waterproof materials are available to protect equipment if this becomes necessary.

In addition to the above, the following must be carried out:

(1)   Check all telephone related instruments.

(2)   Open relevant files.
        -       Open personnel log, record date and time of arrival.
        -       Open in / out message register.
        -       Open Personnel contact file.

(3)   Open file for message/instructions.
        -       These may be left by other personnel.

(4)   Contact operators for call out.
        -       All operators to report or remain on short call.

(5)   Report communications status to Operations Officer.

(6)   Open Communications Status Board.

(7)   Establish contact with Divisional EOC's if applicable.

3.2.3 Response State

This state assumes all operators are in place at the NCCC.

- Communications Officers and Ham Operators re-establish communications at NCCC immediately after event (if this had been disrupted).

(1) Restore power if necessary.

- Use mains supply if available.

- Start emergency plant if required.

- Check voltage value before turning on any equipment.
- Set up additional radio(s) if necessary.

(2) Check telephone lines and associated equipment and report to Operations Officer.

- Determine whether any equipment is working, i.e conventional phones, cellular phones, fax machines, modems if available.

- Use telephone related equipment where possible.

(3) Switch on all radio equipment and check whether in proper working condition.

- Check using Repeaters for Repeater signal.

- Check VHF & UHF radios for channel activity.

- Check Simplex radios with each other.

(4) Establish radio contact with critical agencies by the most appropriate means available and record.

(5) Determine status of NDO's network in all possible modes.

- Check Repeater mode

- Check Simplex Mode

- Check Relay Mode

(6)   Prepare summary of available telecommunications facilities and report to Operations Officer.

-       Complete prepared Form

(7)   Establish radio contact with NCCC and local HAMS.

(8)   Request status report on all relevant support networks and records.

-       Update communications status boards

-       Reassign networks where necessary

(9)   Request Damage Report from Telephone and Electric Utility Companies.

-       Information to be used to minimize efforts on telephone lines (even if NCCC phones are still working). As far as it is practical to do so, in those affected areas without power which are to be targeted for assistance, radio communications should be used.

-       If necessary obtain information on INMARSAT Terminal.

(10) Establish communication links with:
-       Political Directorate
-       Broadcast Stations
-       Meteorological Office, if applicable (HF/VHF/UHF)
-       Seismic Research Unit, if applicable (HF)
-       Regional Security System
-       Maritime Unit, if applicable
-       Other appropriate agencies

(11) Communications Officer must check stations and/or organizations for which equipment assignments were pre-arranged based on the National Plan.

-       Effect remedial action where necessary.

(12) Manage NDO's network as necessary.

3.2.4 Recovery State

This involves closing off the Response State and gradually returning to the Routine State or to Pre-Alert State.

(1)   Monitor restoration of telephone service at the international, national and divisional levels and in particular the critical organizations/institutions. The Restoration times should be recorded.

(2)   Instruct Divisional EOCs to close off emergency channels.

(3)   Instruct HAMS and CBERs to close channels as required.

(4)   Recall all cellular phones as necessary.

(5)   File all documents as appropriate.

(6)   Submit status report to Operations Officer.

(7)   Close Communications Status Board and Log Out.

4.   BASIC RADIO OPERATION

4.1   To Transmit a Message
i.   Select correct channel
ii.   Listen before transmitting to ensure channel is idle.
iii.   Place mouth about 10 cm from microphone.
iv.   Activate PTT and speak clearly without shouting.
v.   At the end of your message, release PTT to receive.

4.2   To Receive Message
i.   Set volume control to mid position.
ii.   Set Mute/Squelch control until rushing noise is heard.
iii   Reset volume to a comfortable listening level.
iv.   Reset Mute/Squelch control until rushing noise is silenced.
v.   Select correct channel.

4.3   Fault Finding Procedure

4.3.1 Total Failure

If the radio is unable to transmit or receive, follow the procedures below.
See Chart on the following page

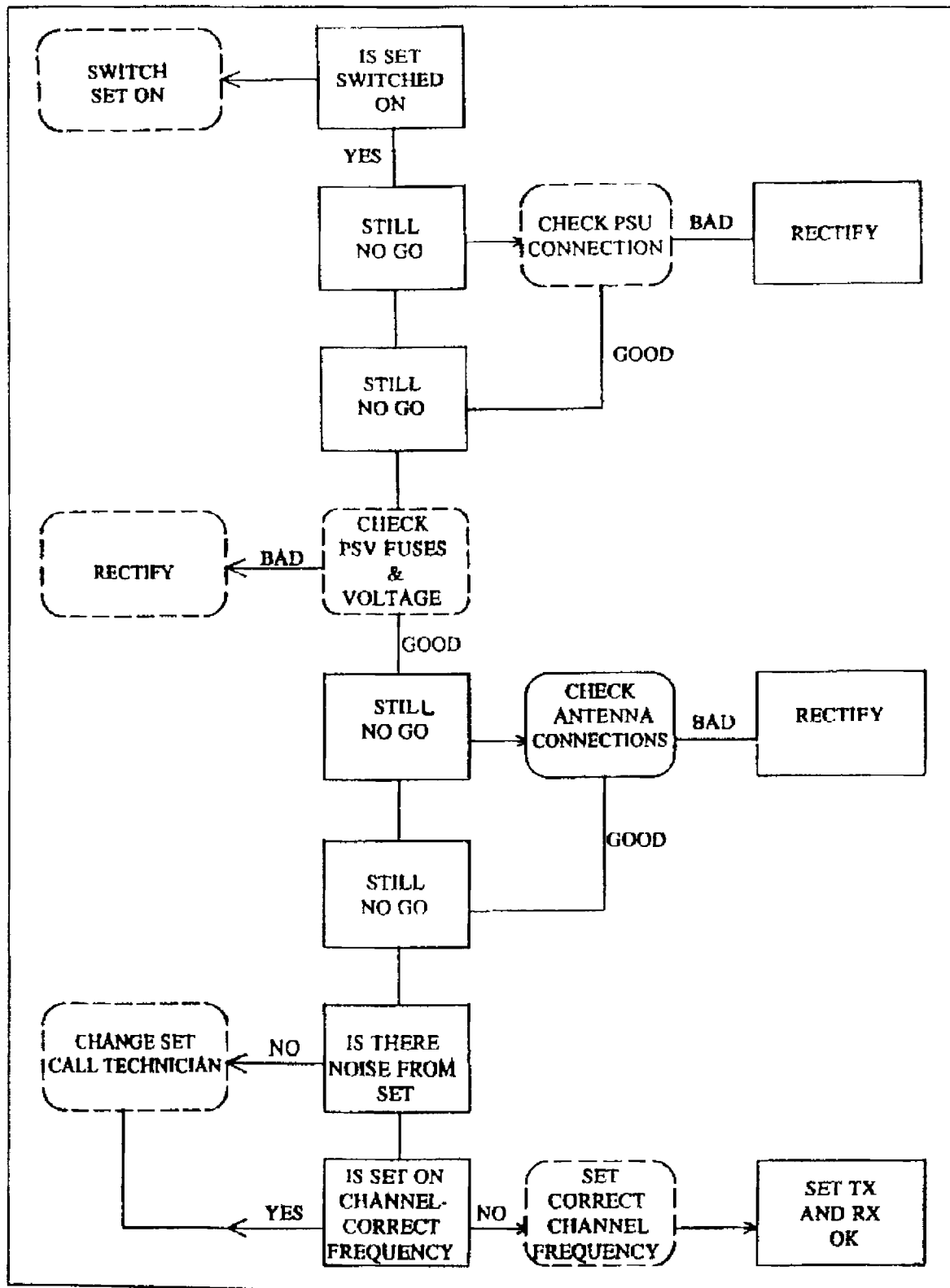### 4.3.2 Receiver Failure
a.   Check volume control and mute setting.

b.   Check speaker connections.

c.   Check that antenna is satisfactorily connected.

4.3.4 Transmitter Failure
a.   Check that microphone button is connected and that PTT is operational.

b.   Check if transmit lamp is glowing.

c.   Check antenna connection.

d.   If wattmeter available, check output power.

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┌─────────────┐      ┌─────────────┐
│  SWITCH     │◄─────│  IS SET     │
│  SET ON     │      │  SWITCHED   │
└─────────────┘      │  ON         │
                     └─────────────┘
                           │ YES
                           ▼
                     ┌─────────────┐      ┌─────────────┐  BAD   ┌─────────────┐
                     │  STILL      │─────►│  CHECK PSU  │───────►│  RECTIFY    │
                     │  NO GO      │      │  CONNECTION │        └─────────────┘
                     └─────────────┘      └─────────────┘
                           │                     │ GOOD
                           ▼                     │
                     ┌─────────────┐             │
                     │  STILL      │◄────────────┘
                     │  NO GO      │
                     └─────────────┘
                           │
                           ▼
┌─────────────┐  BAD ┌─────────────┐
│  RECTIFY    │◄─────│  CHECK      │
└─────────────┘      │  PSV FUSES  │
                     │  &          │
                     │  VOLTAGE    │
                     └─────────────┘
                           │ GOOD
                           ▼
                     ┌─────────────┐      ┌─────────────┐  BAD   ┌─────────────┐
                     │  STILL      │─────►│  CHECK      │───────►│  RECTIFY    │
                     │  NO GO      │      │  ANTENNA    │        └─────────────┘
                     └─────────────┘      │  CONNECTIONS│
                           │              └─────────────┘
                           ▼                     │ GOOD
                     ┌─────────────┐             │
                     │  STILL      │◄────────────┘
                     │  NO GO      │
                     └─────────────┘
                           │
                           ▼
┌─────────────┐  NO  ┌─────────────┐
│ CHANGE SET  │◄─────│  IS THERE   │
│CALL TECHNICIAN│    │  NOISE FROM │
└─────────────┘      │  SET        │
       │             └─────────────┘
       │                   │
       ▼                   ▼
              ┌─────────────┐  NO  ┌─────────────┐      ┌─────────────┐
    ◄─────────│  IS SET ON  │─────►│  SET        │─────►│  SET TX     │
        YES   │  CHANNEL-   │      │  CORRECT    │      │  AND RX     │
              │  CORRECT    │      │  CHANNEL    │      │  OK         │
              │  FREQUENCY  │      │  FREQUENCY  │      └─────────────┘
              └─────────────┘      └─────────────┘
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Fault Finding Procedure For Total Radio Failure

4.4 <u>Radio Batteries</u>

The most popular portable battery is the rechargeable Nickel Cadmium (NiCad) battery. They are compact, light weight, and are capable of being recharged in (1) hour.

To maintain optimum performance, these batteries should not be subjected to:

1.   Continual overcharging

2.   Reduced cycle charging

3.   Storage in excessively hot or cold locations.

Because the output voltage remains virtually constant until the batteries are almost discharged little warning of battery failure is given.

Batteries should not be continuously left on charge or returned for charging after a short period of use. This will severely shorten the battery life. Batteries should be used until completely discharged and then returned for charging.

It is therefore recommended that a spare battery be kept on charge and used on a regular basis.

4.5   Basic Radio Maintenance

It is recommended that radio communications equipment be installed and subsequently serviced every six (6) months by qualified technical personnel. However, there are some basic checks and remedial action which can be carried out by a knowledgeable operator.

4.5.1 Operator Maintenance

Operators should carry out regular maintenance checks as follows:

a.   Visual check of all connections.

b.   Regular on-air testing.

c.   Keep batteries charged and ensure that dry cells are removed from equipment in storage.

d.   Keep radio clean, dry and dust free.

e.   Check all accessories.

Should a fault be found, label the radio and describe the fault with as much information as possible to aid repair. Include name, contact number and all accessing items prior to dispatch for servicing.

5.   EMERGENCY GENERATORS

Emergency generators are intended to provide an electrical supply similar to the normal mains supply. It consists of three main sections.

- (i)   Alternator
- (ii)   Engine
- (iii) Controls

The Alternator provides the electrical output while the engine provides the mechanical input. The engine can use either gasoline or diesel.

While the Alternator and the controls require little or no Routine Maintenance, the engine must be serviced regularly. The engine is similar to the automobile engine and routine servicing will be similar. This includes the regular changing of engine oil and filter and sometimes the 'topping' up to the engine oil. The oil can be checked when the engine is off by removing the dipstick and checking the manufacturer's marks. Plant must be off when refuelling.

The Alternator usually has a voltmeter, ammeter and frequency meters installed to check the voltage, current and frequency respectively of the generated voltage.

The controls are used to start and stop the engine, check oil pressure, engine speed etc. If the plant is to start automatically after mains failure, it is equipped with an automatic transfer switch which senses the mains failure and mains return.

The plant will usually start 30 seconds to a minute after the failure.

The plant is equipped with a battery and charger for starting the engine. The battery will also require maintenance.

In all cases the manufacturer's service schedule and procedures must be followed.

6.   MESSAGE HANDLING

6.1   Phonetic Alphabet

Messages may be handled verbally. Where phonetics may clarify the words of a message, the following I.T.U Phonetic alphabet is recommended.

A	-	Alpha	N	-	November
B	-	Bravo	O	-	Oscar
C	-	Charlie	P	-	Papa
D	-	Delta	Q	-	Quebec
E	-	Echo	R	-	Romeo
F	-	Foxtrot	S	-	Sierra
G	-	Golf	T	-	Tango
H	-	Hotel	U	-	Uniform
I	-	India	V	-	Victor
J	-	Juliet	W	-	Whiskey
K	-	Kilo	X	-	X-ray
L	-	Lima	Y	-	Yankee
M	-	Mike	Z	-	Zulu

6.2   Phonetic Numbers

0	-	ZERO	5	-	FIFE
1	-	WUN	6	-	SIX
2	-	TOO	7	-	SEVEN
3	-	THUH REE	8	-	ATE
4	-	FOR WER	9	-	NINER
			10	-	WUN ZERO

6.3 Distress Calling

One who finds himself in a situation where immediate emergency assistance is required (at sea, in a remote location, etc.), would call "MAYDAY" on whatever frequency seems to offer the best chance of getting a useful answer. "MAYDAY" is from the French m'aidez (help me). The Operator involved should be prepared to supply the following information to the stations who respond to his "MAYDAY".

-   The location of the emergency, with enough detail to permit rescuers to locate it without difficulty.

-   The nature of the distress.

-   The type of assistance required (medical aid, evacuation, food, clothing, etc.)

-   Any other information that might be helpful in locating the emergency area or in sending assistance.

Note: Messages out of distress situation should have priority over incoming messages.

6.4 Written Messages

When the messages are official and formally received in writing, the following message format must be used:

A message contains four (4) parts:-

I **Preamble which gives:**

    (a)   Number of message;
    (b)   Precedence;
    (c)   Handling instructions
    (d)   Station of origin;
    (e)   Check (number of the words in the text);
    (f)   Place of origin;
    (g)   Time filed;
    (h)   Date

Note: Date (YYYY-MM-DD) & Time (HH:MM)
    should be in the international format.
    eg. 1993-09-16 for September 16, 1993
    (see Appendix IV - Page 28)

II **Address**

    To be as complete as possible, including zip codes and telephone numbers, if possible.

III **Text**

IV **Signature:**

    Who has originated the message.

The use of message forms improves the speed of dispatch and also makes for easy filing. (Sample form attached - see page 20).

The preamble is transmitted in the order given above as set out on the message form attached.

The number of the message beginning with 001 at the beginning of each year.

6.5 Precedence

a. The precedence may be 'EMERGENCY' by which is meant any message having life and death urgency to any person or group of persons. This includes official messages authorized by the Director of the EOC during emergencies requesting supplies, materials, or instructions vital to relief of stricken populace in emergency areas. In normal times, this category is very rare. **EMERGENCY MUST NEVER BE ABBREVIATED.**

b. The precedence may be 'Priority'
TRAFFIC ABBREVIATED 'P' and includes important messages having a specific time limit. It can be allocated to official messages not covered in the Emergency category; press dispatches and other emergency related traffic not of the utmost urgency; notification of death in a disaster area; personal or official.

c. The precedence may be 'Welfare' -
Abbreviated 'W'. It includes enquiries as to health and welfare of an individual in the disaster area; and advisory messages from the disaster area indicating that all is well.

d. The precedence may be 'Routine' -
Abbreviated 'R' and refers to most normal traffic.

6.6   Handling Instructions

This is optional, normally follows an 'HX prosign' followed by A through G with or without numbers, indicating how the message should be disposed of.

6.6.1 HX Prosign

HXA   (Followed by a number) Collect telephone call authorized by addressee within.....miles. If no number, collect authorization is unlimited.

HXB   (Followed by a number) If message is not delivered within..... hours of the filing time, notify originating station.

HXC   Report to the originating station, the date and time of delivery (TOD).

HXD   Report, to originating station, date, time and method of delivery of message.

HXE   Delivery station to get reply from addressee and to originate message back.

HXF   (Followed by a date) Hold delivery until.. ..(date).

NOTE
If more than one HX Prosign is used, they can be combined if no numbers are to be inserted. otherwise, the HX should be repeated.

The other items in the preamble are self-explanatory.

7.   RECORDS AND FILING

7.1   Message Handling Technique for Networks

The objective is to handle all messages received accurately and with despatch.

Rules for Net Discipline

A good net is a disciplined net, and discipline must be enforced or the efficiency of the net suffers.

1.   Priority must be given to messages out of the stricken area over messages to the area.

2.   The net must start on time on the assigned frequency.

3.   Ensure that your station is on the net controller's frequency.

4.   Be ready to report present when called. Avoid being late.

5.   List your traffic; but if you have none, say so when you check in. The proper designation is given first. followed by the number of your message. Be familiar with the check-in procedure of the net.

6.   Transmit only when called upon to do so except when you have an emergency. If you are re-checking into the net, announce "recheck" and keep your transmission brief as possible.

7.   Address all transmissions to the net controller unless he instructs you otherwise.

8.   Answer promptly when called. Stay alert.

9.   Do not leave the net until you are excused either singly or by a general securing of the net. If you must leave the net temporarily, be sure to get the net controller's permission, then report back as soon as you return by saying "recheck".

10.   Answer the net controller's question briefly and to the point.

11.   A list of all messages should be recorded in a station log.
       (see page 21)

12.   Know your procedure. The more thoroughly familiar you are with the procedure, the more valuable you are as a net station.

Number	Precedence	Handling Instructions	Station of Origin	Check	Place of Origin	Time Filed	Date

TO

TELEPHONE NO

TEXT

RECEIVED FROM	DATE	TIME	SENT TO	DATE	TIME

STATION LOG

DATE	CHANNEL OR FREQUENCY	SIDE BAND	POWER	STATION WORKED	REPORT RECEIVED	SENT	TIME IN	OUT	REMARKS

8. SAFETY PROCEDURES

Safety is of paramount importance. Every precaution should be taken to ensure that the equipment is perfectly safe, not only for the operator himself but also for other personnel working in or visiting the station. Double Pole switches should be used for all main circuits and interconnecting switches should be fitted so that individual items may be isolated. The whole station should be controlled by one master switch located in a prominent position so that, if anything goes wrong, the whole system can be switched off before anything is touched.

All antennas should be safeguarded against lightning either manually by switching to a good earth when the station is not in use or by the use of lightning arrestors. Great care should be exercised before touching feeders if these have been disconnected during a thunderstorm.

Most shocks sustained from electronic equipment are derived from the 120/240 mains line lead. Also, be sure electric circuit feeding the station is of adequate capacity and that the fuses/circuit breakers do not exceed the recommended rating.

Emergency antennas and inverted V antennas are often near ground level. These positions of the antenna should be protected, and no one should be allowed within 3 feet of these antennas while the station is transmitting. This is a safeguard against radiation burns.

Stations are advised to insure against risk of damage to the equipment by whatever cause, and against liability to damages against persons who may be injured as a result of component failure or other accidents in the station.

Smoking in an enclosed area where batteries are on charge is a hazard.

Coffee and soft drinks must not be placed on equipment or where they may accidentally be spilled on the equipment.

APPENDIX I : RADIO FUNDAMENTALS

Control & Equipment

1. ON-OFF Power Switch - Turns Radio on or Off.

2. Volume Control - Control audio output level of loudspeaker.

3. Mute/Squelch Control - Eliminates background noise and affects receiver sensitivity.

4. Channel Control - Allows selection of channel on multi-channel radios.

5. Freq. Tuning Control - Allows selection of frequency.

6. Indicator lights - Used to indicate power on, signal receive, transmitter on, or channel number etc.

7. Microphone - Two main functions

   (i) Push to talk switch (PTT), used to change radio from receive to transmit.

   (ii) A microphone to convert speech to electrical signals.

Network Modes

These are: (i)   Simplex
            (ii) Repeater
            (iii) Relay

(i)   Simplex -   Applicable to HF, VHF and UHF Bands.
                  This mode is characterized by direct radio to radio communication
                  using a single frequency. HF communication is almost always in
                  this mode. VHF and UHF also use this mode but range is much
                  more restricted than HF.

(ii) Repeater - Applicable to VHF and higher bands. This mode used two
                  frequencies, one for transmit and the other for receive. An
                  intermediate "amplifier" receive the weak signal from the radio,
                  amplifies it and retransmits it on another frequency. The Repeater
                  does this automatically.

                  This extends the range significantly depending on the size of the
                  amplifier.

(iii) Relay -   Applicable to VHF and higher bands. This is similar to the
                  Repeater mode but without automatic operation. An Operator is
                  required to retransmit the received message on the second
                  frequency.

As far as possible, communications should be through the Net controller.

Direct communications on a network frequency should be discouraged.
In cases where additional (simplex) frequencies are available, the net controller should
assign parties to another frequency for direct communication.

Operating HF Radios

The operation of the HF radio is complex and a number of available factors can assist or restrict communication. Considerable training and experience is necessary for effective use of HF radio. While VHF and UHF systems are usually employed in line-of-sight communications, HF is effective over, short, medium and long distances. Distances in excess of 3,000 km are within the capabilities of HF radios.

HF Propagation

HF propagation has two distinct features: GROUND WAVE and SKY WAVE. Some of the energy radiated from the Transmitter follows the ground contours and is termed GROUND WAVE. GROUND WAVE Transmissions are usually short range because a significant amount of the energy is absorbed by the terrain during the transmission. Pure Ground Wave transmissions are not subject to fading. However, topography and terrain can block signals over relatively short distances depending on the location of any two stations at a given time or place.

The situation with SKY WAVE transmission is totally different.Energy from the Transmitter is radiated into the ionosphere. The ionosphere is formed by layers of gas surrounding the Earth. Gases within these layers are ionized - electrically charged - by radiation from the sun and become conductive. The layers refract or bend radio signals back towards the Earth. This allows transmission over considerable distances. This situation is complicated by the fact that the ionosphere varies in height and density with the time of day, season and solar activity. Solar storms can completely disrupt HF transmission. The ionosphere layers also bend signals at varying degrees depending on the frequency in use. This means that operating frequencies must be carefully chosen according to the time of day and the distance of the communication path required. Generally lower frequencies are more suitable for night use while higher frequencies are chosen for day time use. Due to alteration in height and composition of the ionosphere, fading occurs on HF transmission.

APPENDIX II: DISASTER EMERGENCY COMMUNICATION NETWORK

1. The network comprises......

2. The calling frequency - 7.850 MHz USB......

3. Working Channels

    14.303 MHz USB - on an emergency basis only (Amateur)
        CH-10

    10.100 MHz LSB - on an emergency basis only (Amateur)
        CH-7

    7.220 MHz USB - on an emergency basis only (Amateur)
        CH-11

    7.453 MHz USB - on an emergency basis
        CH-5

    3.815 MHz USB - on an emergency basis only (Amateur)
        CH-12

    3.616 MHz USB - on an emergency basis only (Amateur)

    2.527 MHz LSB - on a marine emergency
        CH-3

NOTE: The above Channel Numbers relate only to HF Radios originally provided by the
         PCDPPP with those frequencies installed.
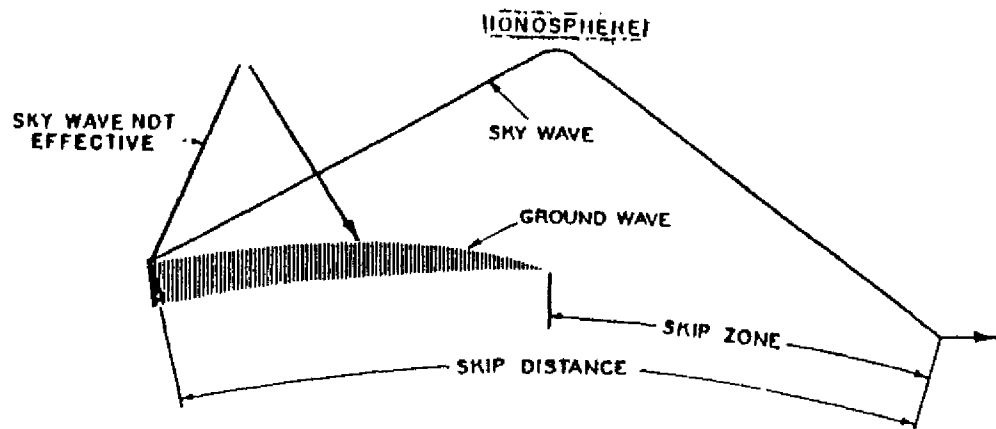
APPENDIX III : FREQUENCIES FOR AMATEUR RADIO EMERGENCY OPERATIONS

1. INTERNAL COMMUNICATIONS

Repeater: (frequencies will vary from country to country)

Simplex: (frequencies will vary from country to country)

2. REGIONAL COMMUNICATIONS

Antilles Emergency & Weather Net   3.815 mhz (night)
     7.170 mhz (day)
     10.115 mhz

Belize, Cayman Is., Jamaica, and the Bahamas
14.050 mhz CW
14.130 mhz SSB

3. EXTRA-REGIONAL COMMUNICATIONS

Morse Code Communication   14.050 mhz + | -
Packet Radio Operations   14.070 mhz + | -
CARIBUS Connection   14.283 mhz

International Assistance and Traffic Net   14.303 mhz
Intercontinental Net   14.313 mhz

APPENDIX IV: INTERNATIONAL DATE FORMAT

It has been recommended that for general record keeping we use the international date format when writing numerical abbreviations of calendar dates. This eliminates the confusion in societies like ours, in which a dual system currently exists which has exactly the same format with different meanings!

The American notation: 11-02-93 means 2nd November 1993

The British/European: 11-02-93 means 11th February 1993

The only way to avoid confusion is for everyone to agree to a prescribed notation - an internationally agreed STANDARD notation.

The International Standardization Organization (ISO) has such a standard. International Standard Number 2014, prescribed in 1976.

The prescribed International Standard Format is:-

Year-Month-Day, (YYYY-MM-DD)

The ISO Standard: 1993-02-11 means in every country;

11th February 1993.

BENEFITS

With the adoption of this standard, some of the benefits to be gained include:-

1.   Better communication regardless of national origin;

2.   Easier computerized manipulation of the date; and

3.   The elimination of unnecessary errors.

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