

Module: Communications

Description

This module prepares students to communicate effectively during both emergency and routine operations. This is important because clear and accurate communication is essential for keeping themselves, other responders, and the public safe.

Module Outcome

At the end of this module, the Firefighter I student will be able to transmit and receive routine and emergency communications in a fireground environment by transmitting and receiving messages using radio etiquette, distinguishing between routine and emergency traffic, reporting emergencies, and activating emergency calls for assistance using fire department communication technology to maintain accountability, safety, and accomplishment of the mission.

Standards

This module aligns with applicable standards in:

- NFPA 1010 *Standard on Professional Qualifications for Firefighters* (2024)
- NFPA 1225 *Standard for Emergency Services Communications* (2022)
- NFPA 1410 *Standard on Training for Emergency Scene Operations* (2020)
- NFPA 1930 *Standard on Fire and Emergency Service Use of Thermal Imagers, Two-Way Portable RF Voice Communication Devices, Ground Ladders, Rescue Tools, Fire Hose, and Fire Hose Appliances* (2025)

This module directly supports three Job Performance Requirements (JPRs) from NFPA 1010.

Table 1: Module Standards NFPA 1010 (2024) Standard on Professional Qualifications for Firefighters Chapter 6 — Firefighter I (NFPA 1001)	
Standard	Requisite Knowledge or Skills
6.2.1 Initiate the response to a reported emergency	<ul style="list-style-type: none">• Procedures for reporting an emergency• Procedures for taking and receiving alarms• Information needs of the dispatch center• Operate fire department communications equipment and technology• Relay information• Record information

Table 1: Module Standards
NFPA 1010 (2024) Standard on Professional Qualifications for Firefighters
Chapter 6 — Firefighter I (NFPA 1001)

Standard	Requisite Knowledge or Skills
6.2.2 Transmit and receive communications using fire department equipment and technology	<ul style="list-style-type: none"> • Communications procedures and etiquette for <ul style="list-style-type: none"> ○ routine traffic ○ emergency traffic ○ emergency evacuation signals • Operate communications equipment and technology • Discriminate between routine and emergency traffic
6.2.3 Activate an emergency call for assistance	<ul style="list-style-type: none"> • Personnel accountability systems • Emergency communication procedures

The NFPA defines requisite knowledge and requisite skills as the minimum a student needs to know and be able to do in order to accomplish the task defined in the JPR.



Note

Radio frequencies are regulated by the Federal Communications Commission, including those used by public safety. When coordinating training involving radios, the AHJ should ensure that the channel bandwidths for the frequency bands being used are in compliance with the national licensing authority’s regulations. (1930 A.11.1.4)

This should include establishing a communications plan for student and instructor radio frequencies so that other routine and emergency traffic is not interrupted. Training organizations should verify that the radios used for training are programmed with authorized channels, obtain departmental approval to conduct training exercises if using live department frequencies, and ensure student communication is monitored for appropriateness in accordance with FCC rules and regulations.

Module Learning Objectives

By the end of this module, Firefighter I students will:

Table 2: Learning Objectives
Module: Communications

ID	Objective	Alignment
LO1	Employ a communication model, given the need to communicate information in routine and emergent scenarios, so that messages are transmitted and received clearly, using proper radio procedures, terminology, and etiquette; emergency traffic is correctly prioritized; and information is accurately relayed without unnecessary delays or miscommunication.	6.2.2

Table 2: Learning Objectives
Module: Communications

ID	Objective	Alignment
LO2	Maintain situational awareness, given an incident, so that all communication is actively monitored, critical information is recognized and responded to appropriately, surroundings are continually assessed, and any changes in conditions or hazards are promptly communicated to the appropriate personnel.	6.2.1
LO3	Operate communications equipment, given common communication equipment and technology, a communication plan, and operating procedures, so that the correct channel is selected, transmissions are clear and concise, proper radio etiquette and terminology are used, and communications are sent, received, and correctly interpreted.	6.2.1, 6.2.2
LO4	Receive incident information, given a transmission from a PSAP, other responding unit, or member of the public, so that all relevant details are recorded, the nature and priority of the communication are identified, and appropriate actions are taken in accordance with departmental procedures.	6.2.1
LO5	Communicate routine information, given common communication equipment and technology, a communication plan, and operating procedures, so that messages are clear, concise, and accurate; proper radio etiquette and terminology are used; and transmissions are acknowledged and understood by the intended recipient.	6.2.1
LO6	Communicate emergency information, given common communication equipment and technology, a communication plan, and operating procedures, so that urgent messages are transmitted clearly and concisely, the communication plan is followed, priority traffic is recognized and given precedence, and the intended recipient acknowledges and responds appropriately.	6.2.1, 6.2.3
LO7	Recognize emergency evacuation signals, given fireground communication systems, standard operating procedures, and an active incident, so that signals are immediately recognized and acted upon, and the hazardous area is evacuated without delay.	6.2.1
LO8	Participate in a personnel accountability system (PAS), given an assigned role within an incident management system, so that status updates are provided as required, and individual accountability is maintained throughout the incident.	6.2.3

Prerequisites

The prerequisite for this module is the Fire Service Orientation Module. This module will require students to participate in a Personnel Accountability System.

Connections to Other Learning

Table 3: Connections to Supported Standards
NFPA 1010 (2024) Standard on Professional Qualifications for Firefighters
Chapter 6 — Firefighter I (NFPA 1001)

Standard	Requirement
6.2.3 Activate an emergency call for assistance	<ul style="list-style-type: none"> Requires PPE in vision obscured conditions.

Communication represents a foundational skill that firefighters will use in every aspect of their career. Concepts of communication are integrated into all programs and all modules.

Coherence

What Students Have Learned Previously	What Students Are Learning Now	What Students Will Learn Later
<ul style="list-style-type: none"> Personnel Accountability Systems (PAS). Basic principles related to the need for accountability and various systems for maintaining accountability. 	<ul style="list-style-type: none"> Communication. Principles of composing and sending clear messages to others. Radios. Basic radio operation and etiquette. PAS. Practical participating in a PAS. 	<ul style="list-style-type: none"> Survival. Students will respond to emergency evacuation signals in a later module.

Boundaries of Instruction and Assessment

The study of human communication and communications systems involves knowledge from the fields of psychology, engineering, and physics. Firefighter students require a basic appreciation and functional understanding of how to communicate clearly and operate common communication equipment. Instructors should focus on what is needed to develop functional entry-level skills.

Module Assessments

Table 4: Formative Assessments
Module: Communications

Description of Skill	Standard	Description of Assessment
Use a Radio	6.2.1	Students will use a radio to receive and acknowledge assignments and transmit the completion of assignments using proper radio etiquette without interfering with other radio traffic.

Table 4: Formative Assessments Module: Communications		
Description of Skill	Standard	Description of Assessment
Maintain Accountability	6.2.2	Students will participate in a Personnel Accountability System (PAS), sending status updates, responding to accountability checks, and using appropriate communication procedures to report any changes in their assignment or location.
Recognize an Emergency Evacuation Signal	6.2.3	Students will recognize and verbalize their response to different types of emergency evacuation signals.

Table 5: Summative Assessments Module: Communications	
Standards Assessed	Description of Assessment
Obtain necessary information from an emergency report. (6.2.1)	
Operate communications equipment and technology correctly. (6.2.1)	
Relay information to dispatch promptly and accurately (6.2.1)	
Transmit accurate, complete, clear information. (6.2.2)	
Relay information within the time established. (6.2.2)	Within 30 seconds
Transmit location during an emergency call for assistance. (6.2.3)	

Module Completion Criteria

To successfully complete this module, students must demonstrate all skills listed in Table 4.

Preparation, Materials, and Resources

Student Preparation

Students should review the relevant materials in their assigned textbook.

Instructor Preparation

- Read and annotate Chapter in Textbook.
- Review **other book chapters or supplemental material.**
- Review and annotate the associated lesson plans and standard evolutions for this module.

Materials and Resources

- Student tasks for communications lab.
- Communications plan.
- Portable radios or other common fire department communication device.

Key Terms

- **Term.** Definition. (Reference)

Revision History

The following table is provided as a quick reference.

Table 6: Revision History	
Module: Communications	
Revision Date	Revision Description
January 2024	The job performance requirement 4.2.2 <i>Receive a telephone call</i> was removed in the 2024 edition of NFPA 1010.

Module Outline

Module: Communications	
Block 1: Online Learning	
<p>Lesson 1: Introduction to Fireground Communications (-- minutes)</p> <p>Learning Objectives</p> <ul style="list-style-type: none"> LO1 Employ a communication model LO2 Maintain situational awareness LO8 Participate in a personnel accountability system (PAS) <p>Enabling Learning Objectives</p> <ol style="list-style-type: none"> 1. Define the role of communication in fire service operations, including its impact on firefighter safety, coordination, and operational effectiveness. (LO1) 2. Identify common challenges that can interfere with effective communication in fireground environments. (LO1) 3. Explain why clear, concise, and properly formatted messages reduce errors and enhance emergency response effectiveness. (LO1, LO2) 4. Describe how effective communication contributes to firefighter accountability, including its role in personnel tracking and situational awareness. (LO8) 5. Recognize how communication breakdowns can lead to operational delays, missed critical information, and increased risk of injury or fatality. (LO2, LO8) 	
Lesson Outline	Resources
<ul style="list-style-type: none"> ▪ The communication process <ul style="list-style-type: none"> • Sender • Message • Channel • Receiver • Factors that interfere with communication <ul style="list-style-type: none"> ▪ Noise ▪ Radio traffic congestion ▪ Unclear transmissions ▪ Impact of Communication on Operations <ul style="list-style-type: none"> • Impact on Firefighter Safety <ul style="list-style-type: none"> ▪ Reduces miscommunication that can lead to accidents or injuries. ▪ Ensures personnel accountability through status updates and evacuation signals. • Impact on Incident Coordination <ul style="list-style-type: none"> ▪ Enables seamless teamwork by ensuring information is relayed effectively. ▪ Supports the Incident Command System (ICS) by keeping responders informed. • Impact on Operational Efficiency 	<ul style="list-style-type: none"> Activities Materials Facilities Notes <p>Lesson content is based in part on the communication model presented in NFPA 1225 Annex D — The Communication Process</p>

Module: Communications

Block 1: Online Learning

- Reduces delays in critical decision-making and resource deployment.
- Helps maintain control in fast-changing fireground conditions.

Lesson 2: Communication Systems and Equipment

(-- minutes)

Learning Objectives

LO3 Operate communications equipment

LO5 Communicate routine information

LO6 Communicate emergency information

Enabling Learning Objectives

1. Describe the design, function, and purpose of common means of fire department communication. (LO3)
2. Explain how each type of communication equipment is used during emergency and routine operations. (LO3)
3. Differentiate between tactical, command, and mutual aid channels. (LO5)
4. Explain the importance of selecting the correct channel for specific types of communication. (LO5)
5. Identify the consequences of improper channel selection or unauthorized use of frequencies. (LO5)
6. Explain how interference, signal loss, and background noise can impact fireground communications. (LO6)
7. Identify strategies for overcoming common radio communication issues. (LO6)
8. Discuss the importance of clear and concise communication to reduce errors caused by radio limitations. (LO6)

Lesson Outline

- **Common means of communication**
 - Portable Radios
 - Analog and Digital radios
 - Design features
 - General
 - Hazard Zone Mode
 - Controls
 - Power and Volume
 - Selector
 - Display
 - Emergency Alert Button
 - Battery
 - Antenna
 - Use during routine operations
 - Use during emergency operations

Resources

Activities

Materials

Facilities

Notes

Parts of this lesson are based on the standards for radio design in NFPA 1930.

Module: Communications

Block 1: Online Learning

- Mobile Radios
 - Mounted in fire apparatus for long-range communication
 - Higher power and extended coverage compared to portable radios
- Mobile Data Terminals (MDT)
 - Used for receiving dispatch information and real-time updates
- Phones
 - When phone use is appropriate vs. radio use
- Computers
 - Use in fire station operations and incident reporting
- Incident Action Plans (IAP)
 - Communication as part of structured incident management
 - Assigning and designating communication responsibilities
- **Communication channels and frequency assignments**
 - Tactical channels
 - Command channels
 - Mutual aid channels
- **Limitations and challenges of radio communications**
 - Interference
 - Signal loss
 - Unclear message
 - Background noise
- Strategies for Improving Communication
 - Adjusting location
 - Slowing down
 - Following established protocols

Module: Communications

Block 1: Online Learning

Lesson 3: Radio Communication Procedures and Etiquette

(-- minutes)

Learning Objectives

- LO1 Employ a communication model
- LO3 Operate communications equipment
- LO5 Communicate routine information
- LO6 Communicate emergency information

Enabling Learning Objectives

1. Use proper radio terminology and etiquette (LO1)
2. Identify radio channels used for routine operations, emergency incidents, and mutual aid responses. (LO3)
3. Recognize common errors in fireground radio communication (LO3)
4. Demonstrate effective transmission and receipt of messages (LO5)
5. Differentiate between routine and emergency communications (LO6)

Lesson Outline

- Selecting the correct channel
 - Review of fire department radio channels
 - Determine the correct channel based on the communication plan
- Proper radio terminology and etiquette
 - Review of communication factors
 - Standardized terminology
 - Best practices for concise and professional radio communication
- Routine vs. emergency communications
 - Differences in tone, urgency, and protocol
 - When to use routine traffic vs. emergency traffic
- Transmitting and receiving messages effectively
 - Techniques for clear and concise messaging
 - Pace
 - Brevity
 - Clarity
 - Acknowledgments and repeating key information
 - Avoiding interruptions and overlapping transmissions
- Common errors in radio communication and how to avoid them
 - Review of the communication process
 - Long messages
 - Think before speaking
 - Improper terminology
 - Using plain English

Resources

Activities
Materials
Facilities
Notes

Module: Communications

Block 1: Online Learning

- Failing to acknowledge
 - Repeat key information

Lesson 4: Receiving and Processing Incident Information

(-- minutes)

Learning Objectives

- LO1** Employ a communication model
- LO4** Receive incident information
- LO6** Communicate emergency information

Enabling Learning Objectives

1. Identify the key components of an emergency transmission (LO1)
2. Record information accurately (LO4)
3. Relay incident information (LO4)
4. Prioritize emergency traffic (LO6)

Lesson Outline

- Understanding Transmissions
 - Calls from the Public
 - Path of a 911 call
 - Overview of 911, Enhanced 911 (E911), and Next Generation 911 (NG911)
 - Common challenges in public-reported emergencies (incomplete or inaccurate information)
 - Transmissions from Dispatch
 - Role of dispatch in emergency communications
 - Key information provided in initial dispatch messages
 - Verifying and clarifying information received
 - Transmissions to Dispatch
 - Common updates and status reports
 - Arrival
 - Hazards
 - Progress
 - Resource needs
 - Proper etiquette for acknowledging and responding to messages
- Recording and Relaying Information
 - Importance of accuracy in emergency communication
 - Best practices for recording essential details
 - Relaying information to the right personnel without delay or distortion
 - Common errors and how to avoid miscommunication

Resources

- Activities**
- Materials**
- Facilities**
- Notes**

Module: Communications

Block 1: Online Learning

Lesson 5: Emergency Communication Procedures

(-- minutes)

Learning Objectives

- LO2** Maintain situational awareness
- LO6** Communicate emergency information
- LO7** Recognize emergency evacuation signals
- LO8** Participate in a personnel accountability system (PAS)

Enabling Learning Objectives

1. Define situational awareness and its role in recognizing changing fireground conditions. (LO2)
2. Describe how maintaining situational awareness improves communication and decision-making during emergencies. (LO2)
3. Identify common emergency evacuation signals used in fireground operations (LO7)
4. Describe the procedures firefighters must follow when an emergency evacuation signal is activated (LO6, LO7)
5. Explain the consequences of delayed or improper response to evacuation signals (LO7)
6. Define the conditions that require a firefighter to declare a MAYDAY (LO6, LO7)
7. List the critical information that must be included in a Mayday transmission using the LUNAR format. (LO6, LO7)
8. Summarize the purpose and function of a PAS in fireground operations. (LO8)
9. Identify different types of PAS, including manual and electronic tracking systems. (LO8)
10. Explain how personnel accountability contributes to firefighter safety and emergency response efficiency. (LO8)

Lesson Outline

- Recognizing and responding to emergency evacuation signals
 - Evacuation signals
 - radio alerts (MAYDAY)
 - air horn blasts
 - PASS alarms
 - Standard evacuation procedures
 - Who gives the order
 - How to respond
 - Consequences of delayed evacuation
- Calling for assistance using Mayday protocols
 - When to call a MAYDAY
 - Lost
 - Trapped
 - Low air
 - Injured
 - Mayday message format (LUNAR method)

Resources

Activities
Materials
Facilities
Notes

Module: Communications

Block 1: Online Learning

- Location
- Unit
- Name
- Assignment
- Resources Needed
- Difference between Mayday and other emergency traffic
- Using the Personnel Accountability System (PAS)
 - Purpose and importance of PAS
 - Types of PAS (manual vs. electronic systems)
 - How firefighters check in and update status
 - How PAS improves firefighter safety and command efficiency
- Role of situational awareness in emergency communication
 - Definition and importance of situational awareness
 - How it improves communication and decision-making
 - Strategies to maintain situational awareness under stress

Module: Communications

Block 2: Communications Lab

Lab 1: Using a Radio

(-- minutes)

Learning Objectives

- LO1** Employ a communication model
- LO3** Operate communications equipment
- LO5** Communicate routine information
- LO6** Communicate emergency information

Enabling Learning Objectives

- 1.

Lesson Outline

- The instructor will demonstrate the following:
 - Transmitting and receiving routine messages using proper etiquette
 - Communicating emergency traffic and prioritizing messages
- The students will receive:
 - Hands-on practice with portable radios

Resources

Activities
FA-01

Materials

Facilities

Notes
This lab can be combined with Lab 2 if practicable.

Module: Communications

Block 2: Communications Lab

- Scenario-based drills to reinforce clear and concise transmissions

Lab 2: Maintaining Accountability

(-- minutes)

Learning Objectives

LO2 Maintain situational awareness

LO8 Participate in a personnel accountability system (PAS)

Enabling Learning Objectives

1.

Lesson Outline

- The instructor will demonstrate the following:
- The students will:
 - Send status updates
 - Respond to accountability checks
 - Use appropriate communication procedures to report any changes in their assignment or location.

Resources

Activities

FA-02

Materials

Facilities

Notes

This lab can be combined with Lab 1 if practicable.

Lab 3: Recognizing an Emergency Evacuation Signal

(-- minutes)

Learning Objectives

LO2 Maintain situational awareness

LO7 Recognize emergency evacuation signals

Enabling Learning Objectives

1.

Lesson Outline

- The instructor will demonstrate the following:
- The students will:
 - recognize different emergency evacuation signals
 - verbalize their response

Resources

Activities

FA-03

Materials

Facilities

Notes

Associated Standards

NFPA 1225 Standard for Emergency Services Communications (2022)

Chapter 3 — Definitions

3.3 General Definitions.

3.3.1* Alarm. A signal or message from a device indicating the existence of an emergency or other situation that requires action by an emergency response agency.

A.3.3.1 Alarm. Events received by electronic signal — that is, fire alarm boxes, central station alarms, and automatic crash notifications.

3.3.1.1* Alarm Data. Digital information related to an alarm that contains the physical location of the alarm and other explanatory information.

A.3.3.1.1 Alarm Data. Other explanatory information can include, but is not limited to, sensor types, alarm types, and access information.

3.3.6 Antenna. A device connected to a radio receiver, transmitter, or transceiver that radiates the transmitted signal, receives a signal, or both.

3.3.13 Band. A range of frequencies between two defined limits.

3.3.14 Base Station. A stationary radio transceiver with an ac or dc power supply or power supply module.

3.3.16 Call. Any type of request for emergency assistance (RFEA), which is not limited to voice.

3.3.33 Conventional Radio. A radio system in which automatic computer control of channel assignments is not required or used, system-managed queuing of calls is not provided, and channels are selected manually by users.

3.3.41 Digital Radio System. A radio system that uses a binary representation of audio from one radio to another.

3.3.52* Emergency. A condition that endangers or is believed to endanger life or property and that requires the urgent response of an emergency response agency.

A.3.3.52 Emergency. The AHJ of the responding agency can determine which types of events qualify as emergencies.

3.3.53 Emergency Dispatch Protocol. A standard sequence of questions used by telecommunicators that provides post-dispatch or pre arrival instructions to callers.

3.3.54* Emergency Event Processing/Dispatching. A process by which an event answered at the communications center creates a call for service and is transmitted to emergency response facilities (ERFs) or to emergency response units (ERUs) in the field.

A.3.3.54 Emergency Event Processing/Dispatching. This term includes caller interrogation and resource selection (the determination of which emergency response unit will respond) up to the start of the emergency response facility notification process.

3.3.59* Emergency Services Communications System. A communications system dedicated to the receipt of events, the coordination and dispatch of first responder resources, and the management of resources and activities post-dispatch.

A.3.3.59 Public Safety Emergency Communications System. A public safety emergency communications system consists of any technology or system utilized for the reporting, detection, coordination, dispatching, monitoring, or tracking of emergency incidents or emergency response resources, and the support of related activities.

3.3.60 Enhanced 9-1-1. Emergency telephone service that provides selective routing and both automatic number identification (ANI) and automatic location identification (ALI) of the calling party.

3.3.63* Frequencies. The particular waveband(s) at which a communications system broadcasts or transmits.

A.3.3.63 Frequencies. Emergency service agencies utilize many different frequencies and modulation technologies to communicate. Frequencies and modulation technologies might include, but not be limited to wavebands, such as very high frequency (VHF), ultra high frequency (UHF), 700/800 MHz, broadband, long-term evolution, etc. When evaluating in-building emergency responder communications enhancement system coverage capabilities, it is important to identify all frequencies and modulation technologies being utilized by and assigned to the public safety agencies of the jurisdiction as detailed in Section 18.11. For example, in the US, the public safety agencies in a jurisdiction might have an 800 MHz trunked land mobile radio system and might also utilize broadband services as a method of their on-scene communications. This could include the nationwide public safety broadband network supported by the FirstNet Authority and other broadband commercial carrier networks.

3.3.67 Incident Management System. The combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

3.3.82 Next Generation 9-1-1 (NG9-1-1). NG9-1-1 is an IP-based system comprised of managed emergency services IP networks (ESInets), functional elements such as applications, and databases that replicate traditional Enhanced 9-1-1 features and functions and provide additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources and to provide multimedia data capabilities for PSAPs and other emergency service organizations. [NENA-ADM-000.23, *NENA Master Glossary of 9-1-1 Terminology*]

3.3.87 Pager. A compact radio receiver used for providing one-way communication or limited digital/data two-way communication.

3.3.91 Portable Radio. A battery-operated, hand-held transceiver.

3.3.99* Public Safety Answering Point (PSAP). A facility equipped and staffed to receive emergency and non-emergency calls requesting public safety services via telephone and other communication devices.

A.3.3.99 Public Safety Answering Point (PSAP). A PSAP is a facility at which emergency calls are first answered, assessed, triaged, classified, and prioritized. The FCC further defines a primary PSAP as a facility to which 9-1-1 calls are routed directly from the 9-1-1 control office. A secondary PSAP is defined as a facility to which 9-1-1 calls are transferred from a primary PSAP.

3.3.105* Radio Channel. A band of frequencies of a width sufficient to allow its use for radio communications. [72, 2022]

A.3.3.105 Radio Channel. The width of the channel depends on the type of transmissions and the tolerance for the frequency of emission. Channels normally are allocated for radio transmission in a specified type for service by a specified transmitter. [72, 2022]

3.3.107* Radio Frequency. A measurement representing the oscillation rate of the electromagnetic radiation spectrum or electromagnetic radio waves.

A.3.3.107 Radio Frequency. The present practicable limits of radio frequency (RF) are roughly 10 kHz to 100,000 MHz. Within this frequency range, electromagnetic waves can be detected and amplified as an electric current at the wave frequency. *Radio frequency* usually refers to the *RF* of the assigned channel.

3.3.109 Repeater. A device for receiving and re-transmitting one-way or two-way communication signals.

3.3.118 Simplex Radio Channel. A radio channel using a single frequency that, at any one time, allows either transmission or reception, but not both, by a particular radio.

3.3.131 Transceiver. A combined transmitter and receiver radio unit.

Annex D — The Communication Process (NFPA 1061)

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

D.1 The Communication Process.

Speech is the unique process of symbolic communication that involves interaction between persons. It is the most unique and universal of human functions; yet, because it is so commonplace, few of us appreciate its enormous power and potential.

The nearly universal lack of speech training in our schools is most likely based on the faulty assumption that because most children can speak and listen by the time they enter preschool and primary programs they need no special instruction in that area. This conditioning is not sufficient to make them fully effective in speaking and listening.

It seems almost incredible that so important a skill as speaking should receive so little attention or training.

Speech communication includes all the factors that are brought into play on and by a person as she or he attempts to establish communication relationships with others.

Communication is necessary in order to establish all social ties, to conduct action with or against others. Without it there can be no dialogue, no response, no establishment of common meaningful concepts; no informative, instructional, or directive action; and no invention, recording, accumulation, or transmission of knowledge.

Results of the reciprocal relationship of speech communication take the following three significant forms: the utilitarian, the aesthetic, and the therapeutic. These results often occur together. For instance, a theater performance might yield all three results.

The utilitarian result is some practical accomplishment of value to one or more members of the interaction. Gerald R. Miller implied this concept when he said:

Speech communication is important because it is one of the primary tools that man employs to manipulate, to control, and to understand his environment.

The aesthetic result is some measure of enjoyment, pleasure, or entertainment for one or more members of the interaction. Speech that is used in television or in a theater performance, in reading literature aloud, in storytelling, and in various other forms of artistic expression becomes a tool to create pleasure.

The therapeutic result is a treatment, a cure, the removal of an inhibition, the diagnosis of a problem, or the re-establishment of the communicative personality. Speech becomes therapeutic when it allows a person to release tensions and to find himself, when it helps a person to explore and examine personal problems that affect his communicative bond with other people, and when it aims specifically at rehabilitating, restoring, and perhaps creating the instruments of human communication.

The effective interaction of speaking and listening requires a particularly close relationship between the participants.

Writing and printing have had a tremendous impact on the recording of ideas, but the key interaction that forms the base of our society is still the spoken word. There is close agreement in the findings of a number of studies of the relative amounts of time we spend in use of the four communicative behaviors. The breakdown of time spent in normal communicative discourse by the average American falls into the pattern found in **Table D.1**.

Communicative Behaviors	Percentage
Listening	42%
Speaking	32%
	74%
Reading	15%
Writing	11%
	26%

The speaking and listening behaviors are functions usually included in the study of speech-communication. On the average, interactions involving speech account for 74 percent of our communication time.

We should use this data carefully. The data tells us nothing about the relative amounts of information transmitted and actually received by means of writing and reading as compared with speaking and listening. We have no research findings on this question, but it seems probable that in any given time more information could be acquired on a precise subject through written words than through spoken words. The key to the matter could lie with the precision of the information transmitted and with the use of the language. In speech, the total message includes much information in addition to the actual spoken words, and the imprecision and redundancy characteristic of speech do not normally occur in written material.

We cannot compare the two forms in terms of the relative amount of meaning that can be developed from them, since the meaning is a function of the person(s) involved. As personal tape recorders are more widely used, more and more spoken material can be reheard. The capability of replaying recorded speech could increase the precision of information being transmitted. As people become more skilled in speaking and in listening, with or without tape recorders, we can expect greater efficiency in speech communication.

Because of the highly transitory nature of the speech act, each effort at the communicative interaction through speech should be as effective as possible. Both speaker and listener should concentrate on grasping as much as possible of all that occurs in the moment of the speech act in order that maximum effectiveness can be achieved in the interaction.

The skills necessary to maximize speech-communication events are developed in many ways. The important skills in the use of language involve behavior that is bimodal, since language is composed of both verbal and nonverbal factors. Verbal skills relate to the spoken words and other vocal sounds that carry information and stimulate meaning. The nonverbal skills relate to the movements of the body and the nonverbal sounds (such as a snap of the fingers) that might occur as information-giving parts of the event.

Language skills are needed not only for transmission but also reception. Transmission and reception are two different processes and require different skills.

A second area of skill development is the creation and construction of messages themselves. We should know what result we want from an effort to communicate an idea. Unless we clearly know what we want to accomplish, we cannot select effective content and materials for the message, nor can we properly evaluate the effectiveness of what we have said.

The substance of the message is central in the speech event and arises from the purpose of the communication. The selection and the arrangement of the materials and the emphasis upon them should meet the requirements of our intent and of the situation. They should also meet the needs of our listener. That is, we should select content that they can receive, understand, and respond to; and we should take care that arrangement and emphasis do not block reception, understanding, and response.

Skills needed for perception and reception of messages are also important. Listening involves more than just hearing the sounds; observing involves more than just seeing what happens; and relating to the speaker involves more than just listening and observing. The content of the message should be organized by the receiver as well as by the transmitter.

The communication process as a total event has been the subject of many studies. Some researchers have used models, or structural descriptions, of the communication event to aid understanding of how the elements we have discussed fit into the general picture, or organization, of the total event. Models provide clues that permit predictions of behavior.

A model provides us with a way to classify and to describe the parts of the process and to indicate how they fit together. Each of the several model types that are used to describe the speech-communication process contributes to an understanding of the total communicative event.

The simplest model consists of the following three elements: the sender, the receiver, and the message [see **Figure D.1(a)**]. In the primary process of this model, a sender transmits a message to a receiver who sends it back. This description obviously omits much of the process, particularly the human factor.

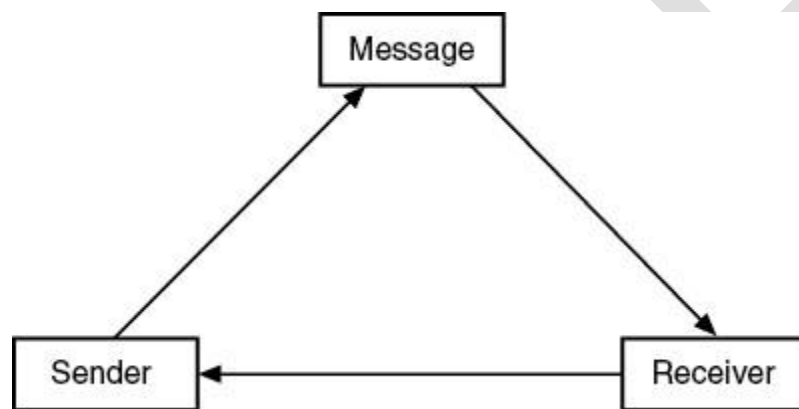


Figure D.1(a) Basic Communications Model.

A more detailed model, which is still quite a general one, is described in **Figure D.1(b)**. Note that this model incorporates several additional factors including the attitudes of both speaker and listener (which introduces human factors); the encoding skills of the speaker and the decoding skills of the listener; and feedback of both positive and negative nature.

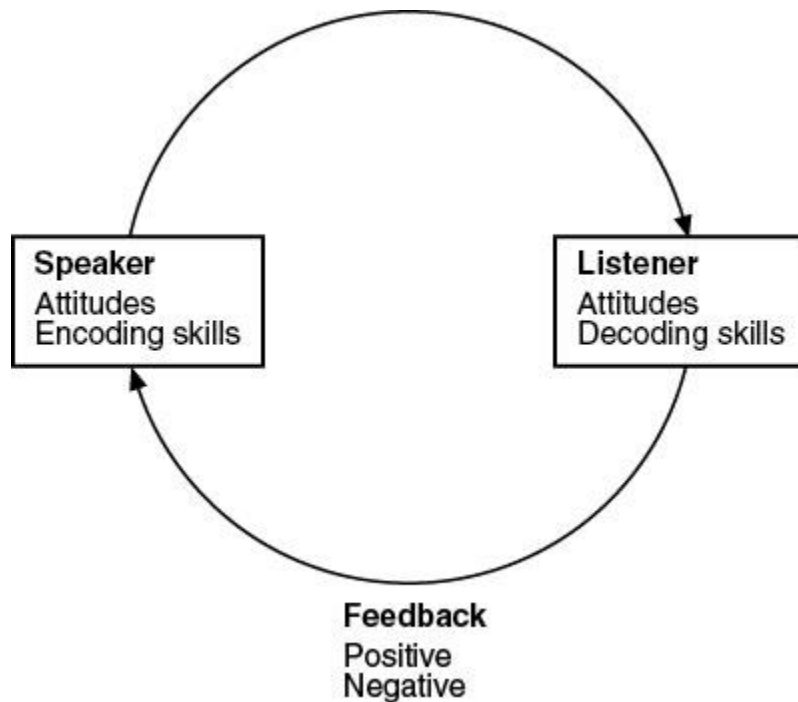


Figure D.1(b) Communications Model with Feedback.

A third model of a somewhat different form is based on the concept of the major elements of the communication event, which are the Source, Message, Channel, and Receiver (the SMCR model). Note that this model is organizational, rather than descriptive of the process. [See **Figure D.1(c)** and **Figure D.1(d)**.]

Source	Message	Channel	Receiver
Communication skills	Elements	Seeing	Communication skills
Attitudes	Structure	Hearing	Attitudes
Knowledge	Content	Touching	Knowledge
Social system	Treatment	Smelling	Social system
Culture	Code	Tasting	Culture

Figure D.1(c) Elements of the SMCR Model.

According to this model, the source and the receiver are affected by the factors of communication skills, attitude, knowledge, social system, and culture. The message is developed by means of the factors of elements, structure, content, treatment, and code. The channels are related to the functions of the five senses: seeing, hearing, touching, smelling, and tasting.

All the models described here have certain common elements. They involve at least two individuals and the creation of messages into the form of physical stimuli that affect the behavior of the individuals.

The availability of people to each other, their common referents, their abilities to use the sensory systems, the character of meaning, the nature of a message and information, and the like are all involved in the process of communication.

As we attempt to control and to increase the effectiveness of our communication events, we discover that it is not enough merely to condition or to refine our skills of creating sound and visible stimuli. We should understand and become sensitive to all the factors that are operative in the event. Then we can examine the processes that are a part of the total event in order to find the fundamental problems that could be affecting our individual communication effort.

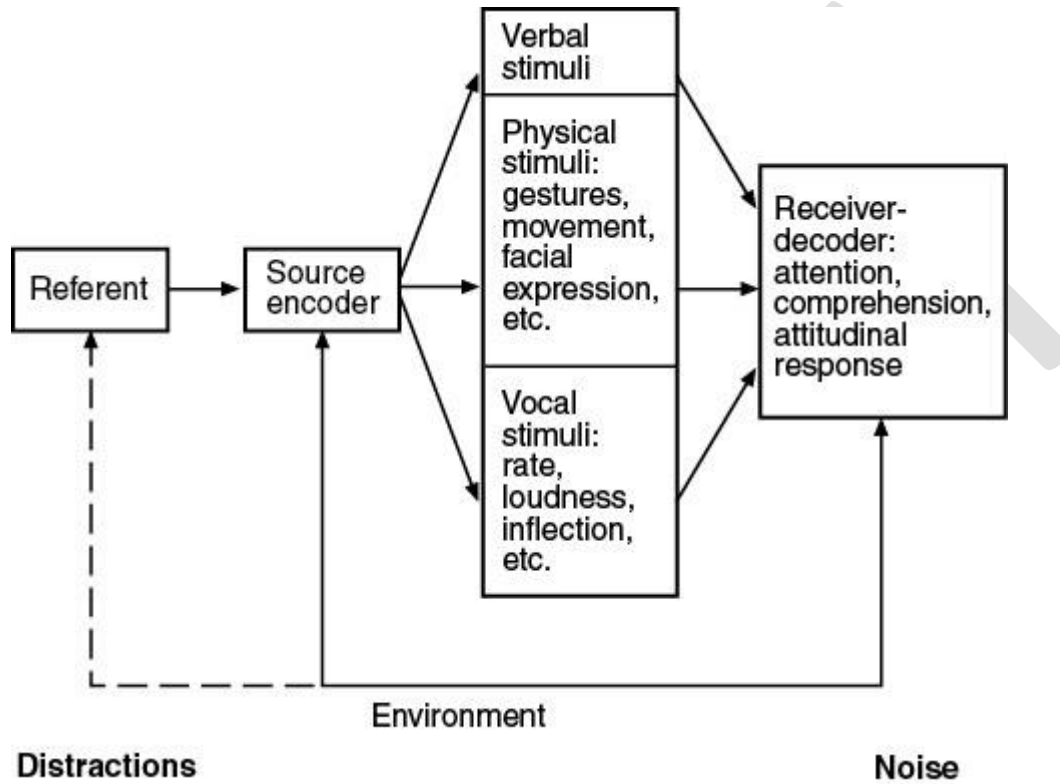


Figure D.1(d) Source, Message, Channel, Receiver (SMCR) Model.

NFPA 1410 Standard on Training for Emergency Scene Operations (2020)

Chapter 3 — Definitions

3.3 General Definitions.

3.3.43* Situational Awareness. The ongoing activity of assessing what is going on around you during the complex and dynamic environment of a fire incident.

A.3.3.43 Situational Awareness. Operations are more effective and safer with continual observance of surroundings, communicating conditions to other members, and monitoring communications.

Chapter 4 — Evolution Preparation

4.4 Fire Control.

4.4.3* Company members shall be able to describe the need for communication as part of emergency scene operations.

A.4.4.3 Many factors impact the growth of a fire and therefore it is critical to control, communicate, and coordinate tactics with interior operations. Proper communications can increase the situational awareness and safety of all operating members thereby allowing them to anticipate changing conditions.

Chapter 7 — Logistics

7.4* Communications.

A.7.4 Proper communication is essential to the efficiency and safety of fire department operations. Several methods are used by fire departments at incident scenes. These methods include two-way radios, hand signals, and audible devices. Communication is an integral component of training, and it should be included as part of the evaluation process.

7.4.1 Communication equipment and methods used by the fire department shall be employed during the evolutions.

7.4.2 Evaluations shall include the effectiveness of communication among members.

NFPA 1410 Standard on Training for Emergency Scene Operations (2020)

3.3 General Definitions.

3.3.26 Incident Action Plan. The objectives reflecting the overall incident strategy, tactics, risk management, and member safety that are developed by the incident commander. Incident action plans are updated throughout the incident. [1500, 2020]

3.3.27 Incident Commander (IC). The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. [472, 2018]

3.3.28 Incident Management System (IMS). A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [1561, 2020]

3.3.43* Situational Awareness. The ongoing activity of assessing what is going on around you during the complex and dynamic environment of a fire incident.

A.3.3.43 Situational Awareness. Operations are more effective and safer with continual observance of surroundings, communicating conditions to other members, and monitoring communications.

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NFPA 1930 Standard on Fire and Emergency Service Use of Thermal Imagers, Two-Way Portable RF Voice Communication Devices, Ground Ladders, Rescue Tools, Fire Hose, and Fire Hose Appliances (2025)

Chapter 11 — Portable RF Voice Communication Devices Design Requirements (NFPA 1802)

11.1.5 All displays shall have a visual indicator that displays the remaining capacity of the power source.

11.1.5.1 The power source visual indicator shall display the state of the available capacity from full to nearly depleted as follows and as shown in Figure 11.1.5.1:

- (1) Four segments displayed — 76 to 100 percent available power source (High).
- (2) Three segments displayed — 51 to 75 percent available power source (Medium).
- (3) Two segments displayed — 26 to 50 percent available power source (Low).
- (4) One segment displayed — 0 to 25 percent available power source (Critical), which also includes the following:
 - (a) The power source visual indicator flashes when 25 percent or less capacity remains.
 - (b) The RF device emits a recurring voice annunciation, “Battery critical,” configurable by the AHJ at least every 10 minutes when 25 percent or less capacity remains.

High	
Medium	
Low	
Critical	 Flashing

11.1.7 All controls, input devices, and input methods shall be designed to prevent unintentional activation, deactivation, and change of operation.

11.1.8 All controls and connectors shall be capable of being operated by a gloved hand.

11.2 Hazard Zone Mode.

11.2.1.1* All RF devices shall be capable of both the hazard zone mode and the nonhazard zone mode.

A.11.2.1.1 The nonhazard zone is expected to include administrative activities, fire marshal (i.e., inspection) duties, EMS runs, and so on. Use in the nonhazard zone is not expected to require some of the special features of the hazard zone mode, such as full RF power emergency transmissions.

11.2.2.1 The minimum volume of the RF device in the hazard zone mode shall be 54 dBA, +6/-0 dB, where measured by the method specified in Section 2.1.20 of TIA-603-E, *Land Mobile FM or PM — Communications Equipment — Measurement and Performance Standards*.

11.3 Location of Controls and Features.

11.3.1

The RF device shall include the following:

- (1) Speaker
- (2) Microphone
- (3) Minimum of one programmable side button capable of being programmed as required by the AHJ
- (4) * Two-position programmable switch capable of being programmed as required by the AHJ

A.11.3.1(4) The two-position switch is typically programmed to provide additional features to the RF device that are commonly used. Examples include encryption on/off, scanning on/off, nonhazard zone selection, or other functions.

(5) * Three-position programmable switch capable of being programmed as required by the AHJ

A.11.3.1(5) The three-position switch is typically programmed to provide three banks of channels, talkgroups, or talk paths. This switch, together with the selector knob of Section 11.4, provides a total of $3 \times 16 = 48$ channels, talkgroups, or talk paths.

11.3.2 Front Side. The front of the RF device shall be the side facing the viewer when the push-to-talk (PTT) button is located on the left side.

11.3.3 Top Side. The top of the RF device shall have the following controls and features:

- (1) Power/volume knob
- (2) Selector knob
- (3) EAB (emergency alert button)
- (4) External antenna, if so equipped
- (5) Display
- (6) Transmit/receive indicator
- (7) Two programmable selector switches, one capable of at least three positions and one capable of at least two positions, capable of being programmed as required by the AHJ

11.3.4 Any additional controls or features on the top, front, rear, left side, or right side of the RF device shall not interfere with any of the required controls.

11.3.5 Left Side. The left side of the RF device shall include the following:

- (1) PTT button
- (2) * At least one programmable button

A.11.3.5(2) The side programmable button can be used for a number of functions. One possibility is that this button plus the volume on/off can be activated simultaneously to completely power down the device to prevent accidental powering down of the device (see 11.2.2.2). Another possible use of this button is to activate the nonhazard zone mode by turning the RF device off via turning off the volume knob and pressing the side programmable button, then turning the RF device back on by turning on the volume knob and pressing the side programmable button. Longer or shorter presses of the side programmable button could also activate additional functions, such as receive scan on/off, although this might add some ergonomic complexity for users.

11.4 Power/Volume Knob.

11.4.1 The RF device shall have a power/volume knob that rotates clockwise to power on the RF device.

11.5 Selector Knob.

11.5.1 General.

11.5.1.1 The RF device shall have a programmable selector knob.

11.5.1.2 The selector knob shall be differentiated in size and shape from the power/volume knob.

11.5.2* The selector knob shall have the following functions and features:

- (1) Minimum of 16 positions
- (2) Detent at each position
- (3) Hard stops at the minimum and maximum positions
- (4) Turning resistance designed to minimize accidental rotation
- (5) Ability to change channels, talkgroups, or talk paths

11.6 Display.

11.6.1 The RF device shall include a primary display of at least eight characters visible without scrolling, with at least six additional characters visible with continuous scrolling.

11.6.2 Backlight Illumination.

11.6.2.1 The primary display shall be capable of being illuminated by means of backlighting when any RF device control is manipulated.

11.6.2.2 The backlight illumination time shall be programmable.

11.6.3 All displays shall be capable of being backlit on the RF device that initiated the emergency mode, and on all RF devices that are receiving the emergency message, until reset in accordance with 11.8.9.

11.6.3.1 All display backlights shall meet the design requirements of 11.15.1.1.

11.6.3.2 The backlight illumination time for an RF device receiving an emergency activation shall be programmable.

11.6.4 Readability.

11.6.4.1 All displays shall be readable from a distance of 609.6 mm (2 ft) in all modes when backlit and in a completely dark room.

11.6.4.2 All displays shall be readable from a distance of 609.6 mm (2 ft) in all modes when backlit and in daylight.

11.8 Emergency Alert Button (EAB).

11.8.1 The EAB shall be located adjacent to the base of the external antenna, if so equipped, or, if not so equipped, adjacent to a guiding feature on the top of the RF device.

11.8.2 The EAB shall be international orange in color.

11.8.3 The EAB shall comprise a minimum of 113 mm² (0.175 in.²) of projected surface area.

11.8.4 The EAB shall be designed to minimize accidental activation.

11.8.5* Activation/Deactivation.

11.8.5.1 The EAB shall be activated after a continuous press of no less than 1 second and no more than 3 seconds, as determined by the AHJ.

11.8.5.2 After EAB activation, the EAB shall be capable of being programmed to be deactivated after a subsequent continuous press of at least 2 seconds.

11.8.6 The activation of the alert button shall cause the RF device to transmit an emergency alert in accordance with TIA-102.AABD, Project 25 Trunking Procedures.

11.8.7 The RF device shall transmit the user ID at the highest RF power the RF device is capable of transmitting and in compliance with the licensing authority.

11.8.7.1 Subsequent emergency transmissions shall be at the highest RF power the RF device is capable of transmitting and in compliance with the radio licensing authority until emergency activation is cleared.

11.8.7.2 The emergency signal shall use the trunking signaling block (TSBK) protocol when operating in analog conventional mode as specified in TIA-5045, Numeric Identifier for Conventional Analog Operation.

11.8.7.2.1* The AHJ shall be permitted to select optional protocols in addition to the TSBK protocol, based on operational need.

11.8.8 The RF device shall have one of the following capabilities for voice transmission upon activation of the emergency button:

- (1) * Remain on selected channels, talkgroups, or talk paths
- (2) * Revert to preprogrammed transmission channels, talkgroups, or talk paths

11.8.8.1 Voice transmission, as specified in 11.8.7.1, shall be at the highest RF power the RF device is capable of transmitting and in compliance with the radio licensing authority.

11.8.8.2 Subsequent voice transmissions from the RF device that initiated the emergency signal shall be at the highest RF power the RF device is capable of transmitting until emergency activation is cleared.

11.8.9 The displayed emergency indication shall remain activated until reset by the initiating user as determined by the AHJ.

11.8.9.1 The receiving RF device shall be capable of allowing the AHJ to do the following:

- (1) Configure it to emit a distinct audible tone for 3 sec \pm 500 ms at maximum volume upon receipt of an emergency activation from another RF device
- (2) Display user data by referring to an internally stored ID database
- (3) Program the RF device to increase its audio output to maximum volume regardless of knob position

11.8.9.2 The receiving RF device shall display the user ID of the initiating RF device.

11.8.9.2.1 The user ID shall be permitted to be cleared from the display at the cessation of the emergency activation.

11.8.9.2.2* Additional emergency alarms received during an incident shall be displayed together with prior emergency alarms of the same incident that have not been cancelled.

11.8.9.3 ID Display.

11.8.9.3.1 The RF device shall have the capability of displaying the user ID of at least 20 active emergency alerts.

11.8.9.3.2 The RF device shall be capable of displaying an ID of a minimum of 14 alphanumeric characters.

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