LBI-4563C

GE MOBILE RADIO

# OPERATORS MANUAL

for

# MASTR CONTROLLER

and

# DESKON II

REMOTE CONTROL UNITS


**DESK MOUNT**
With or without handset or desk microphone


**WALL MOUNT**
With or without handset

GENERAL ELECTRIC

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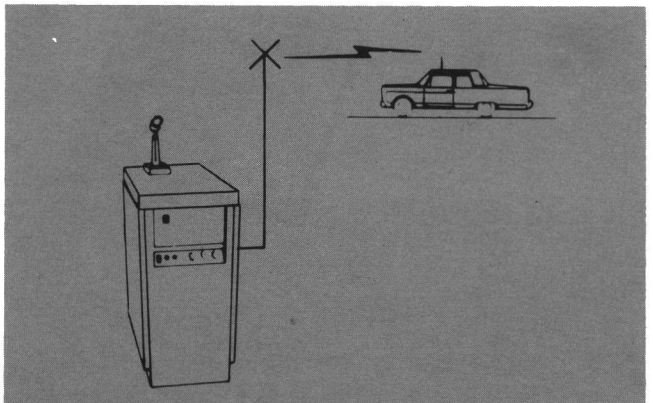
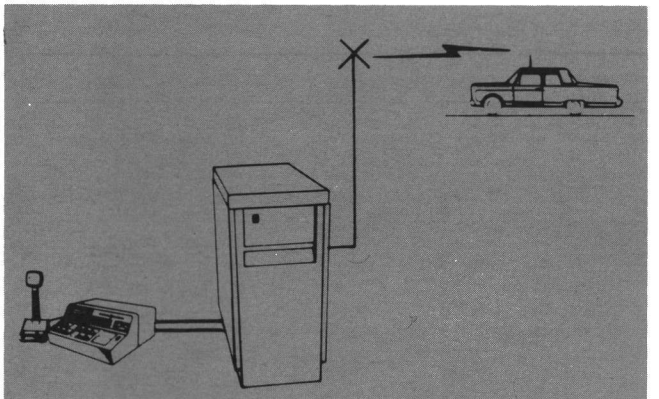
## INTRODUCTION

A Two-Way Radio System usually consists of a base station and one or more mobile units or personal portable radio units. The term "base station" is applied to the radio equipment that remains stationary. The term "mobile unit" is applied to 2-way radio equipment mounted in a vehicle and "personal portable radio unit" is applied to hand or pocket carried 2-way radio equipment.

General Electric Base Stations are designed for Local Control or Remote Control.



**LOCAL** – your station and dispatcher are in the same location and the station is operated by the dispatcher.



**REMOTE** – your station is distantly located and all operation is achieved through a remote control device connected to the station by a pair of telephone lines.

The purpose of this booklet is to provide you, the station operator or dispatcher, with detailed operating instructions for the General Electric MASTR Controller and DESKON units. These units allow you to use and operate a base station necessarily located at a point remote from the dispatch point.

The following information on Two-Way radio systems, licenses, and operating procedures is considered general information and does not purport to cover all details or variations in the operational procedures of your station. Refer to your copy of the Federal Communications Commission (FCC) Rules and Regulations for complete and detailed information on Station Operation Requirements.

# LICENSES

## STATIONS

Before you can use your station, it must be properly licensed by the Federal Communications Commission (FCC). If your operating location is listed as a control point on your radio station license, the license or a photo copy must be posted at your location.

Other remote control units may be connected in parallel with your control unit to operate the same base station. These locations may also be listed as control points or as dispatch points. If not listed as control points, they are considered "dispatch points" and must be operated under the supervision of the operator at a control point.

## OPERATORS

Operators of most base stations do not require FCC operator permits under current regulations. The operator needs only the permission of the licensee to operate the equipment. The operator should be able to receive and transmit spoken English and must understand the FCC Rules and Regulations that pertain to the operation of his station.

# OPERATING PROCEDURES

Two-Way FM Radio Systems must be operated in accordance with the rules and regulations of the Federal Communications Commission (FCC). As an operator of Two-Way Radio equipment, you must be thoroughly familiar with the rules that apply to your particular type of radio operation. These rules help to eliminate confusion and assure the efficient use of existing radio channels. This will result in a smoothly functioning radio network.

**When operating, remember these rules:**

1. It's a violation of FCC rules to interrupt any distress or EMERGENCY MESSAGE or to wilfully interfere with any message. Since your radio operates in much the same way as a telephone "party line", always listen to make sure that the line is clear—that no one else is on the air—before sending any messages. If someone is sending an EMERGENCY MESSAGE—such as reporting a fire, or asking for help in an accident—KEEP OFF THE AIR! Emergency calls have priority over all other messages.

2. Use of profane or obscene language is prohibited by Federal law. Your license can be suspended by the FCC if such language is used.

3. It is against the law to send false call letters, or a false distress or emergency message.

4. The FCC requires that you keep conversations brief and confine them to business. To save time, use coded messages whenever possible. Some examples of the popular "TEN-CODE" are listed inside the back cover of this booklet.

5. It is against the Federal law to repeat or otherwise make known anything you overhear on your radio. Conversation between others must be regarded as confidential.

6. Using your radio to send personal messages (except in an emergency) is a violation of FCC rules applying to most radio services. You may send only those messages that are essential for the operation of your business.

7. The FCC also requires that you identify yourself, at certain specific times, by means of your call letters. For calls between a mobile radio and the base station, the base station must sign off with the assigned FCC call letters. However, when one mobile unit is talking to another mobile, both must sign off with their call letters.

# OPERATING PROCEDURES

## FCC RULES AND REGULATIONS

Although your General Electric sales or service representative can provide you with helpful information concerning FCC Rules and Regulations, the final responsibility for compliance with these rules is yours. Each licensee should have a copy of the rules applicable to his radio service available for ready reference.

FCC Rules and Regulations are available by subscription for each of the radio services, and may be ordered from: Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

Order the Volume which pertains to the Radio Service under which your radio system is licensed. Payment must accompany your order. The following procedures provide examples using the FCC call letters.

## TO ORIGINATE A CALL FROM YOUR STATION

**Example—Base Station to Mobile Station**

| | | |
|---|---|---|
| 1. | Address the unit you are calling and identify yourself. | Base Station: "Car 4, from Headquarters." |
| 2. | Wait for the unit called to answer. | Mobile Unit: "Car 4 . . . go ahead." |
| 3. | Complete your message. | Base Station: "Report back to office when job is completed." |
| 4. | Wait for acknowledgment from mobile, then sign off. | Mobile Unit: "Car 4, Ten-Four". |
| | | Base Station: "KEJ419." |

## TO RECEIVE A CALL TO YOUR STATION

**Example—Mobile Unit to Base Station**

| | | |
|---|---|---|
| 1. | Acknowledge the call as quickly as possible. | Mobile Unit: "Unit 7 to Headquarters." |
| 2. | Identify Yourself. | Base Station: "Unit 7" |
| 3. | Caller will complete message and wait for acknowledgment. | Mobile Unit: "Will report in 10 minutes." |
| 4. | Base station acknowledges and sign off. | Base Station: "OK, 7 KEJ419." |

Always wait for an acknowledgment, never assume your message was received and understood.

When receiving a message, never guess what the other party is trying to tell you. When you are not sure of the message being sent to you, ask the other station to repeat.

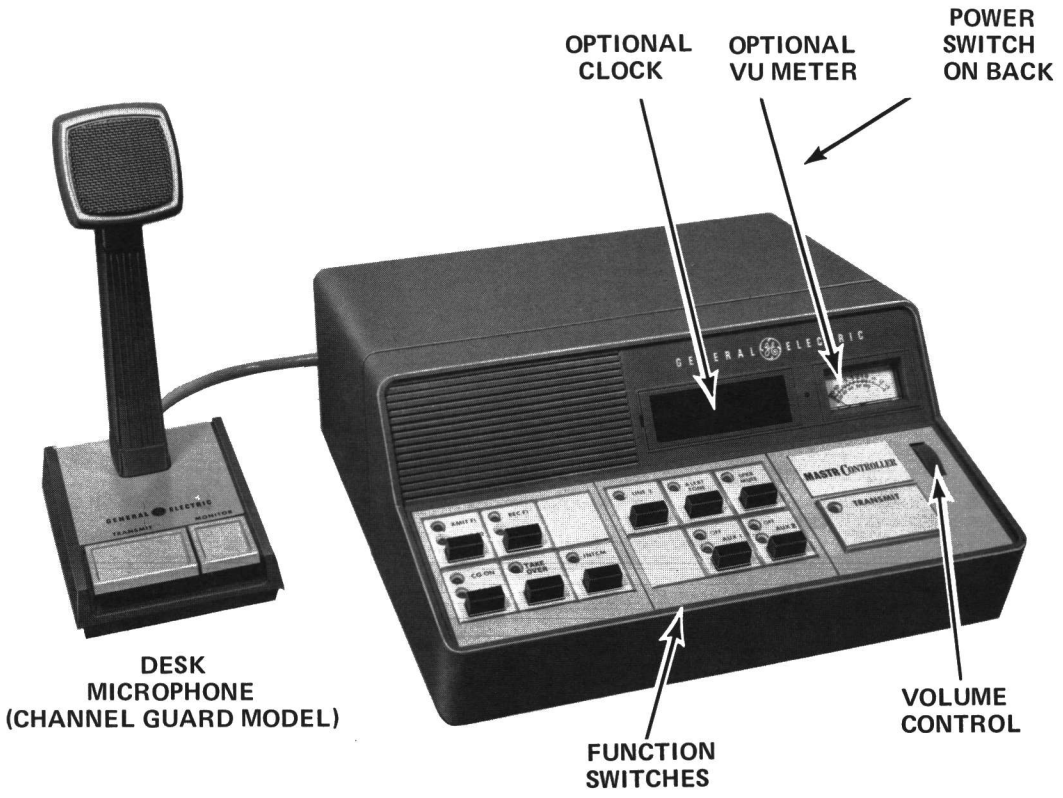
The examples given in this booklet are intended as a general guide. Many radio services such as police, logging, etc. have special procedures that should be followed. The above examples illustrate the most commonly used practices in Two-Way Mobile radio conversations.

## CHANNEL SHARING

Radio frequencies or channels, like our highways, are a shared public resource. Each operator must cooperate with others on the same channel and wait his turn if the channel is being used. Courtesy toward your channel neighbor is essential at all times.

# OPERATING THE MASTR CONTROLLER

**The MASTR Controller is supplied in either the DC control version or the Tone control version. A Desk Microphone, Handset or Boom Microphone is provided with the unit.**




### DESK MICROPHONES

Two Desk Microphones are available for the MASTR Controller. The standard Mike has one pushbutton (TRANSMIT) and is used in systems not equipped with Channel Guard.

### CHANNEL GUARD MICROPHONE

If your Remote Control Station is equipped with CHANNEL GUARD, you will hear only those calls coded with your CHANNEL GUARD frequency. CHANNEL GUARD minimizes the nuisance of listening to conversations between all mobiles and stations on the same frequency.

The desk type CHANNEL GUARD mike has two push buttons on the mike base. When you want to send a message, press the MONITOR button on the mike to determine that no one is using the channel. Then press the microphone TRANSMIT button (also MONITOR button) and send your message. After completing the message, lift your fingers off both push buttons. Your station will automatically return to CHANNEL GUARD operation.

### HANDSET

With the handset in its normal cradle position (on hook) the received signal will be heard on the speaker. With the handset off the hook, the speaker is muted. Hold the handset earpiece to your ear to monitor the channel. To transmit a message, press the PUSH-TO-TALK button on the handset.

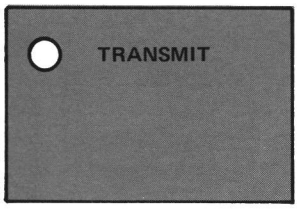
### BOOM MICROPHONE

If your MASTR Controller is equipped with a Boom Mike, use the function pushbuttons on the Controller and speak into the Boom Mike in a normal speaking voice.

# OPERATING THE MASTR CONTROLLER

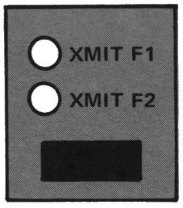
## FUNCTION SELECT SWITCHES

### TRANSMIT



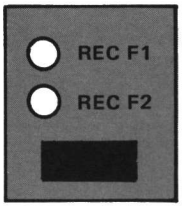

Momentary-action, push-button switch. Lights when pressed and keys the base station transmitter.

### XMIT F1–XMIT F2




Permits operator to select operating frequency in two-frequency stations. Frequency is not changed until TRANSMIT switch is pressed.

### REC F1–REC F2




Allows operator to select frequency to be monitored in two-frequency stations.

### 3- OR 4-FREQUENCY TRANSMIT & RECEIVE (TONE CONTROL ONLY)


The separate 2-Frequency Switches are replaced by a single 3- or 4-Frequency rotary switch. You select both the transmitter and receiver with the same switch.

The channel frequency is not changed just by moving the switch to a new position. After selecting the desired frequency you must momentarily press the TRANSMIT switch to change the frequency of both transmitter and receiver, then you can monitor the selected channel.

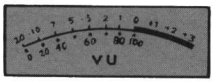
## OPTIONAL FUNCTIONS

### INTERCOM

The INTERCOM accessory lets you talk to a maintenance technician at the base station or to other remote control locations in your system without energizing the transmitter. Simply depress the INTCM switch and talk into the microphone. These conversations are not "broadcast".

### VU METER

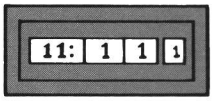
The VU Meter enables you to check the line level of the MASTR Controller. When you are talking into the microphone, the needle on the VU meter should occasionally swing up to zero (0).



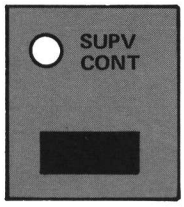

VU METER

### DIGITAL CLOCKS

A 12 or 12/24-hour clock is available for use with the MASTR Controller.

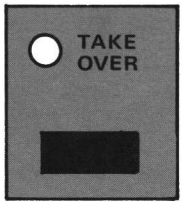


# OPERATING THE MASTR CONTROLLER



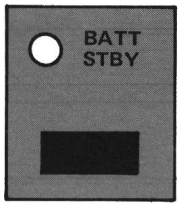

### SUPERVISORY CONTROL SWITCH (DC CONTROL ONLY)

The Supervisory Control Switch gives you full supervisory control over all transmissions from other Remote Control Units in your system. You can terminate unauthorized transmissions by pressing in the Supervisory (SUPV) pushbutton.



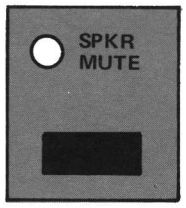

### TAKE OVER SWITCH (TONE CONTROL ONLY)

This switch allows the operator to completely disable all paralleled control units in the system and assume full control.




### BATTERY STANDBY SWITCH (DC CONTROL ONLY)

This switch allows the operator to switch to a standby battery to operate the Controller whenever the main power system fails. This switchover is automatic in the tone control system.

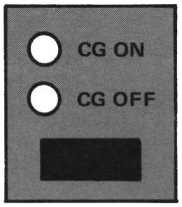



### SPEAKER MUTE SWITCH

The SPKR MUTE switch provides you with a convenient method of reducing the speaker volume without changing the VOLUME control setting. Simply press in the switch to reduce the speaker volume to a low listening level. This feature is useful when the operator is interrupted by telephone calls, office conversations, etc.

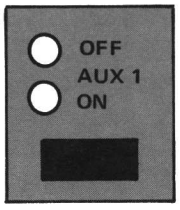

### TONE ALERT OSCILLATOR

With this accessory, you can transmit an alerting tone signal to mobile units in your system to attract their attention to messages of special importance. Simply press the tone push button for a second before sending a message.



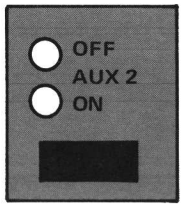

### CG ON – CG OFF (TONE CONTROL ONLY)

Permits disabling the Channel Guard function at the base station. When CG OFF is selected, the operator will monitor all signals on the channel.



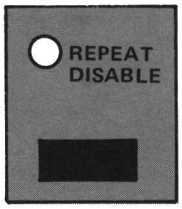

### AUXILIARY 1 (TONE CONTROL ONLY)

Permits turning an auxiliary device on or off at the base station. This function is not compatible with 3- or 4-Frequency Transmit & Receive.




### AUXILIARY 2 (TONE CONTROL ONLY)

Permits turning a second auxiliary device on or off at the base station.




### REPEATER DISABLE SWITCH

Depressing this switch allows the operator to prevent the remote station from operating as a repeater. The station can then be operated as a remote station.

**NOTE**

Repeater stations extend the range of a Two-Way Radio system. The Repeater is a relay station—it automatically picks up and retransmits messages between a control station and the mobile units.

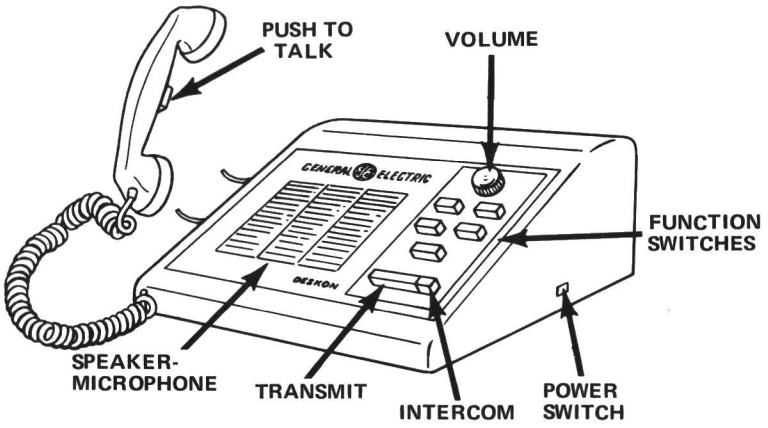
# OPERATING THE DESKON II

**The DESKON II is supplied in either the DC Control version or the Tone Control version. All versions contain a speaker-microphone. In addition, a desk microphone or handset may also be supplied.**

## OPERATING THE DESKON II IN THE HANDSET MODE

**NOTE**

With the handset in its normal cradle position (on hook), the system will operate in the speaker-microphone mode. With the handset off the hook as shown, the speaker is muted. This puts the system into the handset mode. This method is recommended since background noise is greatly reduced.




### TO TRANSMIT:

1. Slide Power Switch to the ON position. Leave in this position at all times.
2. Select desired frequency channel (in two-frequency systems) and press PUSH-TO-TALK button. A red indication light (transmit) will glow on control unit.
3. Talk into handset microphone using normal speaking voice.

### TO RECEIVE:

1. Select desired frequency channel (in two-frequency systems) and release the PUSH-TO-TALK button to receive. Red TRANSMIT light will be extinguished.
2. Hold handset earpiece to ear to receive message.

## OPERATING THE DESKON II IN SPEAKER-MICROPHONE MODE

### TO TRANSMIT:

1. Select desired frequency channel (in two-frequency systems) and press TRANSMIT bar. A red light will appear on Control Unit.
2. Talk into speaker-microphone using normal speaking voice.

### TO RECEIVE:

1. Select desired frequency channel (in two-frequency systems). Signal may be monitored on speaker-microphone. TRANSMIT bar must be released to receive.

# OPERATING THE DESKON II WITH THE DESK MICROPHONE

**NOTE**

Two Desk Microphones are available for the DESKON II. The standard microphone has one push button (TRANSMIT) and is used in systems not equipped with Channel Guard. The Channel Guard microphone has two push buttons (TRANSMIT and MONITOR).

### STANDARD MICROPHONE

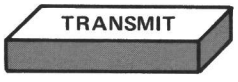
When you want to send a message, press the TRANSMIT button on the mike and speak into the mike using normal speaking voice.

### CHANNEL GUARD:

If your Remote Control Station is equipped with CHANNEL GUARD, you will hear only those calls coded with your CHANNEL GUARD frequency. CHANNEL GUARD minimizes the nuisance of listening to conversations between all mobiles and stations on the same frequency,

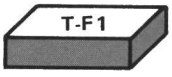
The desk type CHANNEL GUARD mike has two push buttons on the mike base. When you want to send a message, press the MONITOR button on the mike and listen to be sure that no one is using the channel. Then press the microphone TRANSMIT button (also MONITOR button) and send your message. After completing the message, lift your fingers off both push buttons. Your station will automatically return to CHANNEL GUARD operation.

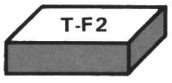
## DESKON II FUNCTION SELECT SWITCHES




### TRANSMIT:

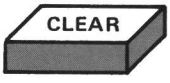
Momentary-action push button switch. Keys the base station transmitter.



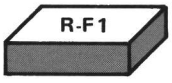

### TRANSMIT F1 – TRANSMIT F2:

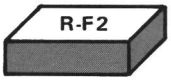
Permits operator to select operating frequency in two-frequency systems. Frequency is not changed until TRANSMIT switch is depressed.




### CLEAR:

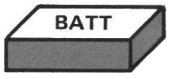
In GE-MARC V applications, the CLEAR button is pushed to terminate a call. This clears only your radio and does not affect other users on the channel.



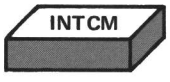

### RECEIVE F1 – RECEIVE F2:

Permits operator to select operating frequency in two-frequency systems. Available in DC control systems only.




### BATTERY STANDBY:

*(DC Control Only)* Allows the operator to switch to a standby battery to operate the DESKON II whenever the main power fails. This switchover is automatic in the tone control system.




### INTERCOM:

The INTERCOM switch lets the operator talk to a maintenance technician at the base station or to other remote control locations in the system without energizing the transmitter. Simply depress the INTCM switch, operate the TRANSMIT switch and talk into the microphone. These conversations are not broadcast. When the conversation is completed, be certain to release the TRANSMIT switch before releasing the INTCM switch.

# SYSTEM PERFORMANCE CHECKS

This section is prepared to help you – the station operator to become acquainted with some of the problems of atmospheric phenomena as well as other symptoms that you may encounter in the operation of the Two-Way Radio System.

As your experience increases, you will be able to identify a problem as atmospheric or as an equipment problem in a mobile unit or at the base station. When you encounter any transmitting or receiving difficulties, make a note of the symptoms plus any other pertinent information at the time of occurence; then notify your service technician. The information that you jot down will assist your technician in locating and correcting any problems that may occur.

Many "service" type calls are the result of external influences – such as an accident or perhaps re-positioning of the station or accessory equipment. In particular always check to be sure the power plug is firmly inserted into the building power receptacle.

The following descriptions, lists of symptoms and probable causes will help you to understand and determine whether the difficulty is atmospheric or if the base station or mobile unit is at fault.

## IGNITION AND OTHER VEHICULAR ELECTRICAL SYSTEM NOISE

Most internal combustion engines use electrical systems which are a prime source of the "hash" or "popping" interference sometimes encountered in highly sensitive mobile recievers. This effect is noticed mostly in a vehicle loudspeaker. Your General Electric Communications consultant is available to advise you concerning suppression of ignition and electrical system radiation; if this proves troublesome in specific vehicles.

## DEAD SPOTS

Dead spots or "holes" in the coverage area (if any) are areas where mobile units cannot hear or talk to the base station. When you have learned the location of these dead spots, you may wish to instruct the driver of a mobile unit to call in before driving through one of these areas. This is especially true if the driver intends to remain in the area for any length of time.

## SKIP INTERFERENCE

Skip interference is a phenomenon that occasionally lets you hear other stations or mobile units that are hundreds or even thousands of miles away. These distant stations and mobile units can frequently hear you too, as the effect works in both directions. It is caused by the reflection of radio waves by a layer of the atmosphere many miles above the earth's surface, in much the same manner that light is reflected by a mirror. This type of interference can be minimized if your station and mobile units are equipped with CHANNEL GUARD. Your stations more powerful local signal will generally override these "skip signals".

## COVERAGE AREA CHANGES

As you become familiar with the normal coverage area or range of your station, you will note that your coverage, particularly in the fringe area, will vary from day to day, from hour to hour.

The following examples of the popular "TEN-CODE" are designed to help operators of Two-Way Radio to keep messages brief and to the point. A decal of the "TEN-CODE" signals is available for mounting in your place of business. Ask for ECR-441 at your Authorized General Electric Service Station.

## TEN-CODE

10-1 — Receiving poorly
10-2 — Receiving well
10-3 — Stop transmitting
10-4 — Okay
10-5 — Relay
10-6 — Busy
10-7 — Out of service
10-8 — In service
10-9 — Repeat, poor reception
10-10 — Entering (customer) area
10-11 — Visitors present
10-12 — Visitors not present
10-13 — Completed present assignment
10-14 — Return to your station
10-15 — What is your location?
10-16 — Call station by telephone
10-17 — Disregard
10-18 — Stand by until no interference
10-19 — Do you have contact with
10-20 — Leaving (customer) area
10-30 — Ready for assignment
10-50 — Emergency Message

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