

ICOM

INSTRUCTION MANUAL

VHF FM TRANSCEIVER
IC-V68

UHF FM TRANSCEIVER
IC-U68



Icom Inc.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS INSTRUCTION MANUAL. This manual contains important safety and operating instructions.

The transceiver's function display can be set to indicate channels or frequencies. However, this instruction manual describes operation during channel indication **ONLY**. For operation using frequency indication refer to the *IC-V68/U68 Programming Manual*.

CAUTIONS

⚠ NEVER connect the transceiver to an AC outlet or to a power source of more than 16 V DC.

⚠ NEVER connect the transceiver to a power source using reverse polarity.

⚠ NEVER allow children to operate the transceiver.

AVOID using/placing the transceiver in areas with temperatures below -10°C ($+14^{\circ}\text{F}$) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

AVOID placing the transceiver in direct sunlight.

AVOID uninterrupted transmission periods of 1 min. or longer. Ideally duty cycles of transmit : receive should be about 1 : 4. Higher duty cycles will cause the transceiver to heat up.

BE CAREFUL! When operating the transceiver with a DC power source connected to the BP-99, remove dry cell batteries to avoid possible battery leakage.

BE CAREFUL! The use of non-Icom battery packs and chargers may impair transceiver performance and invalidate the warranty.

UNPACKING

The following accessories are included with the transceiver*:

- ① Flexible antenna..... 1
- ② Belt clip..... 1
- ③ Battery case (the BP-99 comes attached to the transceiver).. 1

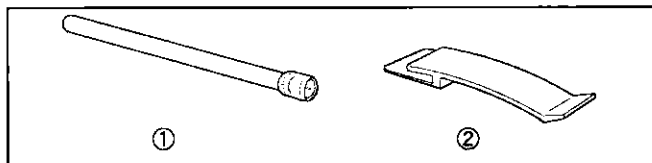


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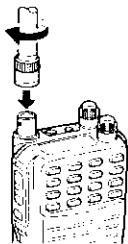
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GETTING STARTED

◆ Antenna

Connect the supplied flexible antenna to the antenna connector and rotate the antenna clockwise.

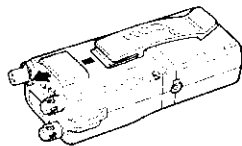


CAUTION: Transmitting without an antenna may damage the transceiver.

◆ Belt clip

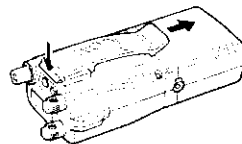
To attach:

Slide the belt clip into the plastic loop on the back of the transceiver.



To remove:

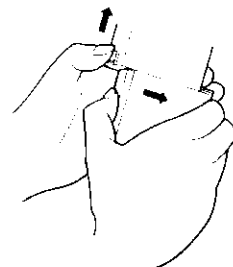
Push the top of the belt clip towards the transceiver and at the same time, push it downwards and free of the plastic loop.



◆ Battery case attachment and removal

To remove:

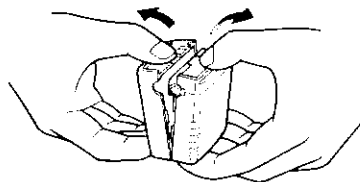
Push and hold the battery release button upwards, then slide the battery case to the right with the transceiver facing you.



To attach:

Mate the notched ends of the transceiver and the battery case, and slide the battery case into place until a click sounds.

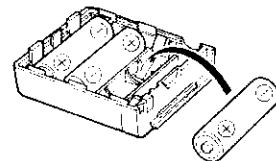
◆ Dry cell battery installation



Open the battery case.

Install AA (R6) × 6 dry cell batteries.

• Pay attention to the polarities.

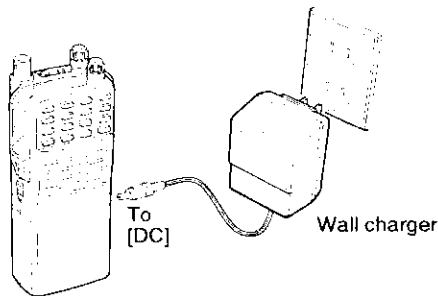


◇ Regular charging

(for supplied BP-99 only)

CAUTION: Only Ni-Cd batteries can be charged. NEVER connect a wall charger when dry-cell batteries are installed – the transceiver and/or battery case may be damaged.

Connect the optional BC-77A/E/D/V to the [DC] jack on the battery pack.



- Approx. charging period: 15 hr.
- The optional CP-13L CIGARETTE LIGHTER CABLE WITH NOISE FILTER or OPC-288L DC POWER CABLE with a 12 to 16 V DC power source can also be used. In this case, the transceiver can be left ON while charging.

◇ Rapid charging

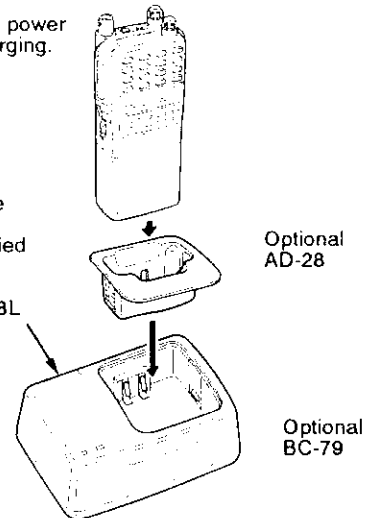
All optional battery packs listed on p. 12 can be charged using the BC-79.

- ① Insert the optional AD-28 CHARGER ADAPTER into the charging slot of the BC-79 DESKTOP CHARGER.
- ② Firmly insert a battery pack into the AD-28.

Be sure to turn power OFF while charging.

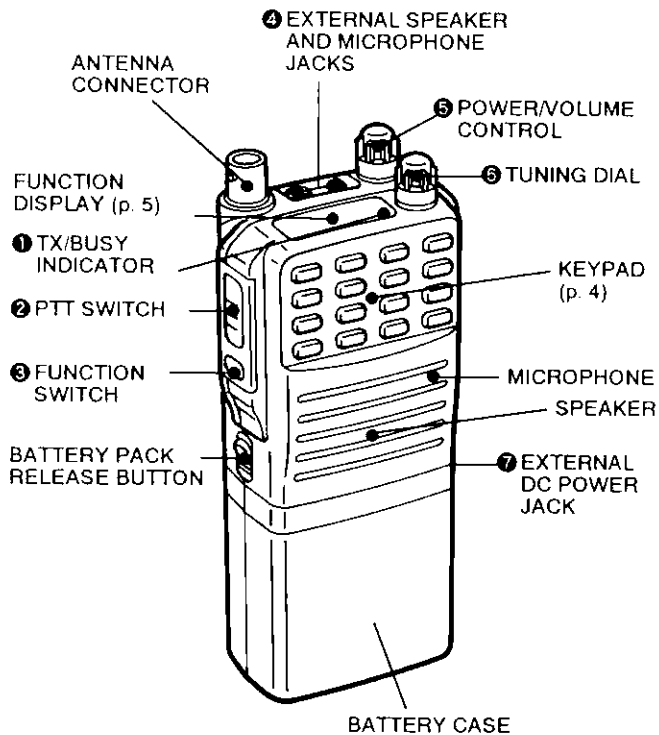
Connect one of the following:

- AC adapter supplied with the BC-79
- Optional CP-13L
- Optional OPC-288L



- Approx. charging period: 1 to 1.5 hr.

Front, side and top panels



1 TRANSMIT/BUSY INDICATOR (p. 7)

- Lights red while transmitting.
- Lights green while the channel is busy.

2 PTT SWITCH [PTT] (pgs. 7, 8)

- Push and hold to transmit, release to receive.

3 FUNCTION SWITCH [FUNC]

- Activates secondary functions of other switches. (p. 4)
- When pushed once, then immediately pushed and held a second time, activates the monitor function. (p. 6)

4 EXTERNAL SPEAKER AND MICROPHONE JACKS [SP], [MIC] (p. 12)

- Connect an optional speaker-microphone or headset, if desired.

5 POWER/VOLUME CONTROL [OFF/VOL] (pgs. 7, 8)

- Turns the power ON and OFF, and adjusts the audio.

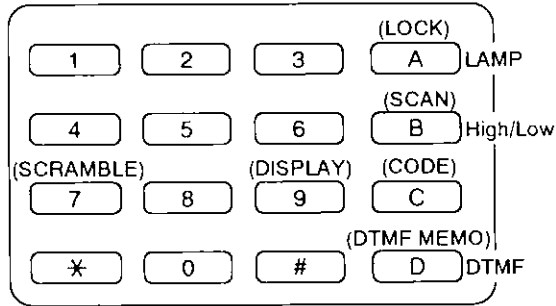
6 TUNING DIAL [DIAL] (pgs. 7, 8)

- Selects a channel, etc.

7 EXTERNAL DC POWER JACK [DC 12.5 V] (p. 2)

- Connects a wall charger or a 12–16 V DC power source for charging.
- Connects a 6–16 V DC power source for operation.

◆ Keypad



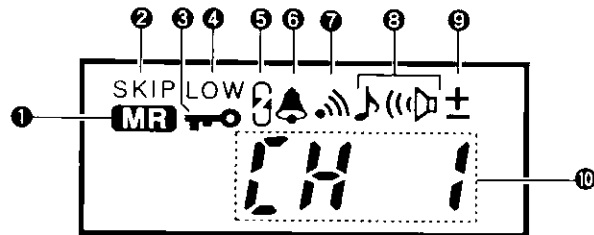
Except for DTMF codes (0–9, *, #, A–D), the keys on the keypad are not labelled. Use the diagram above as a quick reference for key functions during operation.

- Functions in brackets are activated while pushing [FUNC] (see table at right).
- While pushing [PTT], any of the keys can be used to transmit DTMF codes manually. (see p. 10)

◆ Key action

(LOCK) A LAMP	<ul style="list-style-type: none"> •Toggles the function display lighting ON and OFF. (p. 11) •While [FUNC] is pushed, toggles the lock function ON and OFF. (p. 11)
(SCAN) B H/L	<ul style="list-style-type: none"> •Toggles high and low output power. (p. 11 – optional) •While [FUNC] is pushed, starts and stops the scan function. (p. 6 – optional)
(CODE) C	<ul style="list-style-type: none"> •Clears the display and enters standby for ANI manual code transmission. (p. 8 – optional) •While [FUNC] is pushed, indicates ANI code for re-programming. (optional)
(DTMF MEMO) D DTMF	<ul style="list-style-type: none"> •Activates DTMF code transmit mode. (optional) •While [FUNC] is pushed, indicates DTMF contents for DTMF channel selection and re-programming. (p. 10 – optional)
(SCRAMBLE) 7	While [FUNC] is pushed, toggles the voice scrambler function ON and OFF. (p. 7 – optional)
(DISPLAY) 9	While [FUNC] is pushed, reverses the function display characters 180°. (p. 11)

■ Function display



① SCAN INDICATOR

Appears and flashes during scan operation.
Scan may automatically start when turning power ON.

② SKIP INDICATOR

Appears when the selected channel is set as a skip channel.

③ LOCK INDICATOR (p. 11)

Appears when the lock function is activated.

④ LOW POWER INDICATOR (p. 11)

- Appears when low output power is set for the selected channel.
- Appears when low output power is manually selected.

⑤ VOICE SCRAMBLER INDICATOR (p. 7)

- Appears when the voice scrambler function is set for the selected channel.
- Appears when the voice scrambler function is manually selected.

⑥ CODE SQUELCH INDICATOR (p. 7)

Appears when the code squelch function is set for the selected channel.

⑦ ANI INDICATOR (p. 8)

Appears when the ANI function is set for the selected channel.

⑧ TONE INDICATORS (p. 7)

- “♪” appears when the subaudible tone encoder is set for the selected channel.
- “♪ ((D)” appear when the tone squelch function is set for the selected channel.

⑨ DUPLEX INDICATORS

“-” or “+” appears when semi duplex is set for the selected channel.

⑩ CHANNEL NUMBER READOUT

Indicates the selected channel (up to 40).

■ Operating modes

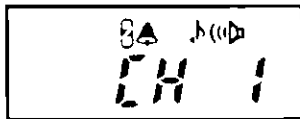
This transceiver has 2 major modes of operation, ANI and non-ANI. Only one of these modes can be programmed at one time; a quick look at the function display easily distinguishes them as illustrated below.

◇ ANI operation



☎ appears

◇ Non-ANI operation



☎ disappears

Other indications may or may not appear depending on programming.

If you are not sure which mode your transceiver is programmed for, consult your system operator or Icom Dealer, then follow the operating instructions accordingly in the following sections.

■ Common functions

◇ Monitor function

Depending on programming, a monitor function may be available.

Push [FUNC] momentarily, then immediately push and hold [FUNC] again to temporarily monitor a channel.

- All signals are received, including weak ones and those not directed to you specifically.

◇ Time-out timer

The time-out timer prevents prolonged channel occupation. When the time-out timer is set for a channel, the transceiver operates as follows:

- When [PTT] is continuously pushed, 2 beeps sound 10 sec. before the time-out timer activates.
- After the time-out timer activates, 2 beeps sound again and further transmitting is inhibited.

◇ Scan function

This function searches programmed channels in sequence.


Push [FUNC]+[B] to toggle the function ON and OFF.

- When transceiver power is turned OFF during scan operation, scan resumes when power is turned ON again.

3 OPERATION

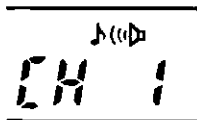
■ Non-ANI operation

CAUTION: Transmitting without an antenna may damage the transceiver.

- ① Turn power ON and set the [VOL] control to the 10 to 12 o'clock position.
- ② Rotate the [DIAL] to set the desired channel. 
- ③ Received signals are emitted from the speaker.
 - Further adjustment of [VOL.] may be necessary at this point.
- ④ Push and hold [PTT] to transmit.
 - The transmit/busy indicator lights red.
- ⑤ Speak into the microphone at a normal voice level.
 - DO NOT hold the transceiver too close to your mouth or speak too loudly. This may distort the signal.
 - Depending on programming, transmitting may not be possible when the transmit/busy indicator lights green.
- ⑥ Release [PTT] to return to receive.

◇ Tone squelch

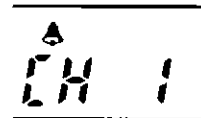
The indications at right appear when the tone squelch function is programmed for the selected channel.



This function rejects undesired signals.

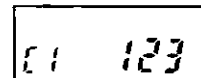
◇ Code squelch

The indicator at right appears when the code squelch function is programmed for the selected channel. 3 code sounds are emitted ahead of the transmitted audio when pushing [PTT].



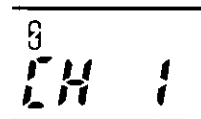
This function also rejects undesired signals.

To select a code for transmission, push [FUNC]+[C], then rotate [DIAL] until the desired code appears.



◇ Voice scrambler

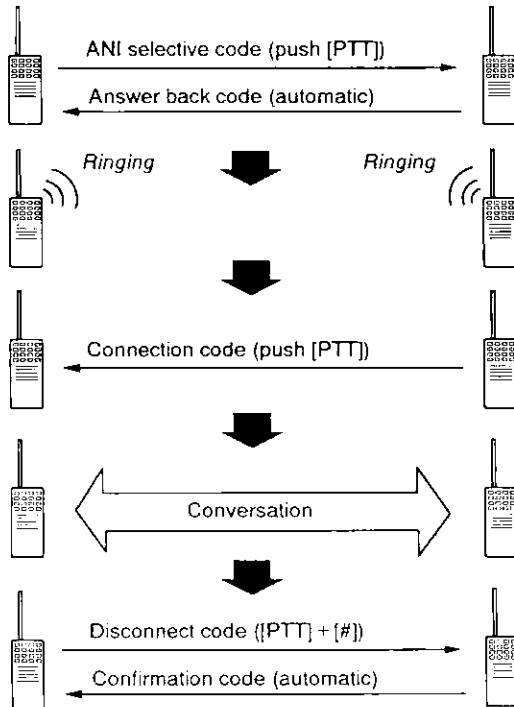
The indicator at right appears when the voice scrambler function is programmed for the selected channel. This provides private communications between transceivers using the same function.



This function can be turned ON and OFF by pushing [FUNC] + [7], depending on programming.

■ ANI operation

The ANI (Automatic Number Identification) function enables selective calling and automatically sends an answer back to a calling station when connected.



CAUTION: Transmitting without an antenna may damage the transceiver.

◇ Calling a single station

- ① Turn power ON and set the [VOL] control to the 10 to 12 o'clock position.
- ② Rotate the [DIAL] to set the desired channel or push [FUNC] + [B] to start scanning.
 - Consult your system operator for your adopted system.
- ③ Push [PTT] once to connect to the desired station.
 - The transceiver transmits an audible code and then "rings" when a connection is made.
- ④ When the transceiver rings, wait for an answer back call from the other station.
 - A beep sounds and " " flashes to indicate an answer back.
 - You can now converse with the connected station. Push [PTT] to transmit and release to receive.
- ⑤ When your conversation is finished, while pushing [PTT] push [#] to transmit a disconnect code.
 - Either party can perform this operation.

3 OPERATION

◇ Calling group stations

Transceivers belonging to the same group can be called simultaneously.

- ① Set the transceiver to the ANI standby condition.
 - Follow steps ① and ② in *Calling a single station* on the previous page.
- ② Push [C], then input 3 digits for the desired stations, including [D] at least once, to transmit a group code.
 - See group code examples below.
 - When making group calls the transceiver does not ring or receive any answer back as in regular calls.
- ③ Use [PTT] in the regular way to communicate.
- ④ When your conversation is finished, while pushing [PTT], push [#] to transmit a disconnect code.

◇ Group call code examples

[Example 1]

If "11D" is transmitted, transceivers with receive codes "110" to "119" are called.

[Example 2]

If "1D3" is transmitted, transceivers with receive codes "103," "113," ... "183" and "193" are called.

//// **NOTE:** "DDD" transmits to ALL transceivers.

◇ Waiting for a call

- ① Set the transceiver for the ANI standby condition.
 - Follow steps ① and ② in *Calling a station* on the previous page.
- ② When your transceiver rings, wait for the ringing to stop, then, push [PTT] once to transmit an answer back call.
 - The transceiver emits beeps, then "📶" flashes.
 - Now you can communicate with the connected station (push and hold [PTT] to talk and release to listen).
- ③ When your conversation is finished, push [#] while pushing [PTT] to transmit a disconnect code.
 - For group calls, only the calling party can perform this operation (see left).

◇ Time-out timer during ANI operation

A separate time-out timer may be programmed for ANI operation. In this case, the time-out time is counted down once a connection is made with another transceiver regardless of whether the [PTT] is continuously pushed or not.

- Once a connection is established the time-out time begins to count down, and 3 beeps sound 10 sec. before the time-out timer activates.
- After the time-out timer activates, the disconnect code is transmitted automatically and the transceiver returns to the standby condition.

■ DTMF codes

A DTMF (Dual Tone Multi Frequency) encoder is available as an option. DTMF codes are used for autopatching, accessing repeaters, controlling other equipment, etc.

◇ Manual transmission

While pushing [PTT], push one of the keys to transmit the corresponding DTMF code sequentially.

- This function may not be available. Ask your system operator.

◇ DTMF memory transmission

DTMF memory channels, when programmed, can be transmitted instantly.

To transmit a DTMF memory, push [D], then push one of the digit keys (0–9) within 2 sec.

- The corresponding DTMF memory channel is automatically transmitted.



While "d" appears, push the desired DTMF memory channel number. The DTMF tones can be heard as they are transmitted.

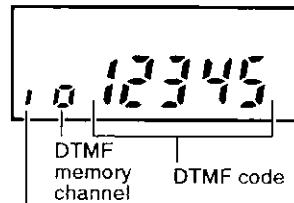
NOTE: DTMF memory channels must be programmed in advance and DTMF memory transmission must be enabled. Consult your system operator for details.

◇ DTMF memory programming

10 DTMF memory channels (0 to 9) may be available for programming up to 16-digit DTMF codes.

This function may be inhibited depending on Dealer programming. Consult your system operator when the following procedure cannot be performed.

- ① While pushing [FUNC], push [D] to enter DTMF programming mode.
- ② Rotate the [DIAL] to select the desired DTMF channel.
- ③ Push keys in sequence for the desired DTMF code.
- ④ While pushing [FUNC], push [✖] to set the code.
 - When inputting a 16-digit code, this step is not necessary.



This display indicates DTMF memory "0" is selected and "12345" is programmed as the DTMF code.

- Digit indicator:
- 1 – 0 to 5 digits programmed
 - 2 – 6 to 10 digits programmed
 - 3 – 11 to 15 digits programmed
 - 4 – 16 digits programmed

3 OPERATION

■ Display lighting

◇ 5 sec. timer

Push [A] momentarily to turn the display lighting ON. After 5 sec. of inactivity (in which no keys are pushed) the lighting automatically turns OFF.

◇ Continuous lighting

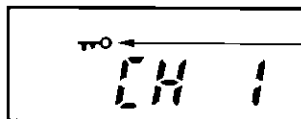
Push [A] for 2 sec. to turn the display lighting ON continuously. To turn the lighting OFF, push [A] momentarily.

- To conserve battery power, turn the lighting OFF when it is not needed.

■ Lock function

The lock function allows you to inhibit DTMF memory, scan and manual ANI code transmission functions.

Push [FUNC]+[A] to toggle the lock function ON and OFF.



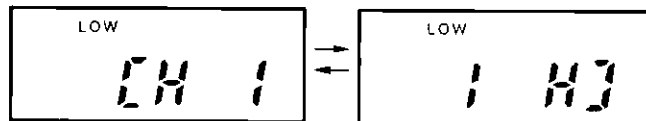
Appears when the lock function is activated.

■ Reversing the display

This function rotates the channel indication in the function display 180° and is convenient for viewing the transceiver from the top when it is attached to your belt.

Push [FUNC] + [9] to reverse the function display.

- Push [FUNC] + [9] again to rotate the display back to its previous orientation.

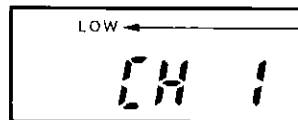


NOTE: Only the channel readout is rotated – any other indications (low power, etc.) are not rotated.

■ Output power

When a channel with low output power is selected, "LOW" appears. Pushing [B] changes the programmed output power.

- Manual selection of output power may be inhibited depending on programming.



"LOW" appears when the selected channel is programmed for low output power.

■ Specifications

◇ General

- Frequency coverage : IC-V68 136–174 MHz
IC-U68 400–470 MHz
- Number of channels : 40 max.
- Mode : FM (18K0F3E)
- Antenna impedance : 50 Ω (nominal)
- External DC power : 6 to 16 V DC (negative ground)
12 to 16 V DC (for charging)
- Current drain (at 13.8 V, typical) :

	CONDITION	IC-V68	IC-U68
RX	Power saved	8 mA	15 mA
	Max. audio	150 mA	150 mA
TX	High	1000 mA	1500 mA
	Low	500 mA	700 mA

- Usable temperature range : -10°C to +60°C
- Dimensions : 54(W) × 145(H) × 35(D) mm
- Weight : 330 g

◇ Transmitter

- Output power : (High) IC-V68 5 W
IC-U68 3–5W
(Low) both models 500 mW
- Max. freq. deviation : ± 5 kHz
- Spurious emissions : IC-V68 Less than -60 dB
IC-U68 Less than -50 dB

◇ Receiver

- Sensitivity : IC-V68 : 0.25 μV for 12 dB SINAD
IC-U68 : 0.3 μV for 12 dB SINAD
- Audio output power : More than 350 mW
- Audio output impedance : 8 Ω

■ Options

◇ Battery packs/case, chargers, adapters and cables

- **AD-25** battery charge adapter
Attaches to the BP-157A, BP-160 or BP-174 for connection to a charger (BC-77, etc.).
- **BC-77A/D/E/V** wall charger
- **BC-79** desktop charger + **AD-28** battery pack adapter
For rapid charging.
- **BP-157A** battery pack
(7.2 V; 900 mAh for long life)
- **BP-160** battery pack
(7.2 V; 700 mAh)
- **BP-174** battery pack
(12 V; 600 mAh for high output power)
- **BP-99** battery case
Takes six (6) AA (R6) size batteries. Equipped with a DC power jack that can be used for both charging and operation.
- **CP-13L** cigarette lighter cable with noise filter for operation in a vehicle
- **OPC-288L** DC power cable

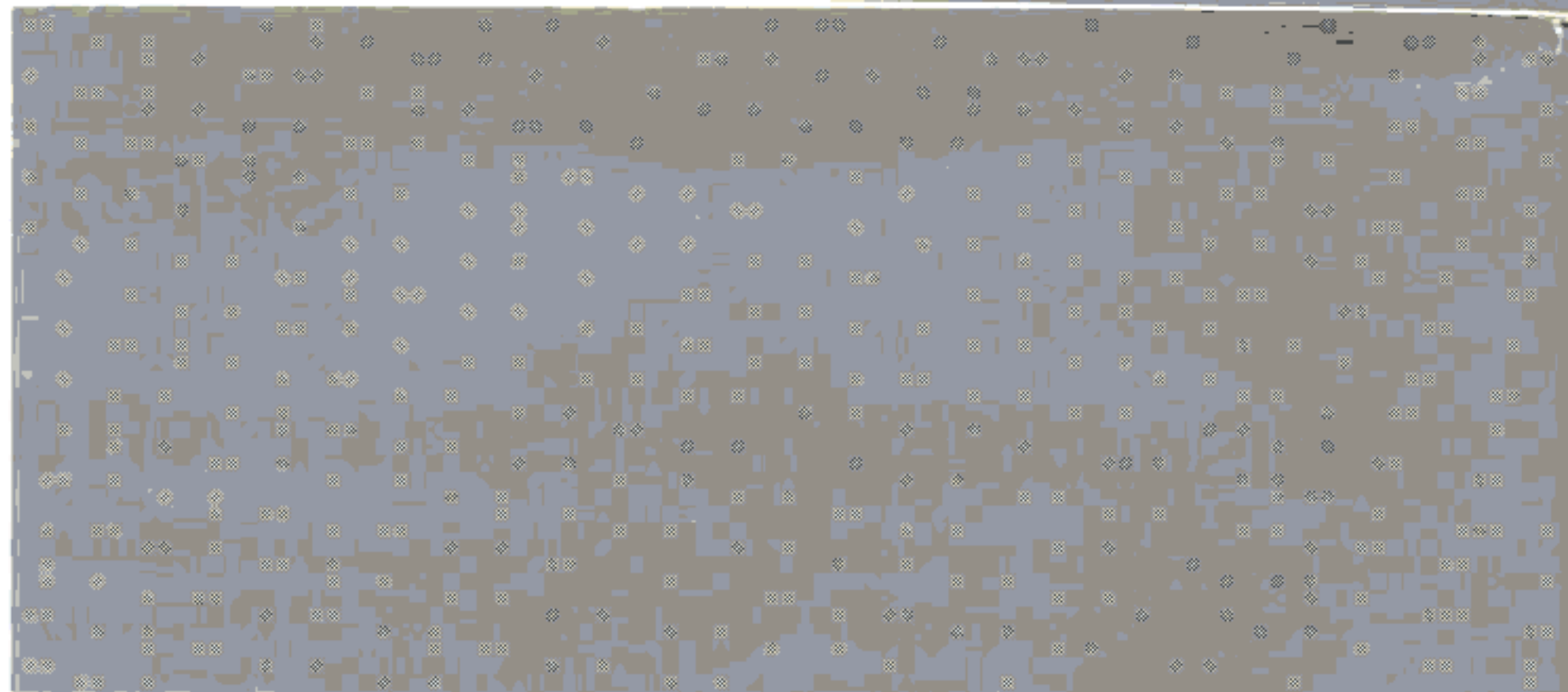
◇ Speaker-microphones, headset and earphone

- **HM-46** speaker-microphone
- **HM-54** speaker-microphone
- **HM-55** DTMF speaker-microphone
- **HS-51** headset
- **SP-13** earphone

◇ Internal units

- **UT-86** tone squelch unit
- **UT-88** voice scrambler/tone squelch unit

Count on us!



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