

HAND-HELD TRANSISTORIZED CONDENSER DTMF COMMUNICATIONS MICROPHONE



GENERAL

The Shure Model 885TT is a hand-held, amplified, condenser DTMF communications microphone with an illuminated keypad. The microphone is ideal for upgrading existing two-way radios for use with advanced telephone interconnect systems or for new installations. It is designed for rugged and reliable operation in any mobile communications application. The 885TT has an omnidirectional pickup pattern and provides extremely clear transmission, even in noisy environments. In addition to its clear, crisp, natural voice response, the 885TT has extremely low sensitivity to hum pickup and low susceptibility to radio frequency interference.

For installations where transmitter input gain requires sensitivity modification, the 885TT has convenient, externally accessible screwdriver controls for independent adjustment of both microphone and DTMF levels. This eliminates the problem of fixed audio levels and the necessity for disassembling the microphone for adjustments. Restricting control access also prevents accidental changes common to external controls.

The 885TT is designed for use with most currently available mobile two-way radio transceivers. For installation convenience, all microphone and signalling functions, including keypad illumination, are powered directly from the microphone input circuit of most transmitters, minimizing the need for equipment modification. The microphone is compatible with a choice of five-conductor, pre-wired, coil-cord MODULINK® cables (sold separately), each of which has a telephone-type modular plug on the microphone end, and a choice of popular transmitter input connectors on the other.

One cable model is supplied without a connector on the transceiver end so that the user or installer can attach the desired connector. The cables are instantly changed or replaced without soldering.

The 885TT features attractive, contemporary styling, designed to blend with most radio designs and vehicle interiors. The microphone is ergonomically designed; it fits naturally and comfortably in the hand and is not affected by heat or humidity. The rugged ARMO-DUR® case is immune to oil, grease, most fumes and solvents, salt spray, sun, rust and corrosion. It is outstanding in its ability to withstand mechanical shocks and vibration. The Million-Cycle Plus™ leaf-type switch is a double-pole, single-throw type, designed to resist the effects of severe operating conditions and constant usage. It has nickel-silver blades, and its contacts are palladium-alloyed for reliable, oxidation-free operation.

The 885TT's keypad is made of tough silicone rubber, with durable printed characters that will last the life of the microphone. The keypad is backlit by red LEDs, easily visible during night operation and minimizing eye readjustment for night vision.

The 885TT is supplied with a small screwdriver for adjusting the microphone amplifier gain and DTMF level, and for releasing the modular-plug microphone cable from the microphone. Mounting brackets for affixing to radio equipment or other surfaces are available in quantities of three as Shure RK6MB.

Features

- Top-Talk Sound Channels™ for clear voice input, easy handling
- Built-in transistor amplifier (powered by carbon-microphone-type circuit)
- Frequency response from 200 to 4,000 Hz, tailored for voice communications
- Illuminated keypad with positive tactile feel and audible confirmation tones
- Auto push-to-talk (APTT) automatically keys transmitter when keypad is depressed
- Convenient external microphone gain adjustment accommodates most input circuits
- Simple, easy-to-use continuous-tone dialing
- Externally accessible DTMF level adjustment, independent of microphone gain setting
- Modular-plug coil-cord—easily attached and removed. Available with plugs to fit most popular radio sets
- Low sensitivity to hum pickup

NOTICE:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

- Low susceptibility to radio frequency interference
- Rugged Million-Cycle Plus leaf-type switch stands up under severe environments and constant use
- High-impact ARMO-DUR® case—stronger and lighter than die-cast metal, comfortable to the touch in hot or cold weather
- Rugged and dependable under all operating conditions
- Sturdy, convenient mounting button for attaching to equipment or nearby surface using optional mounting bracket
- Hang-up button connection available for microphone hang-up sensing (Mounting bracket must be grounded.)

SPECIFICATIONS

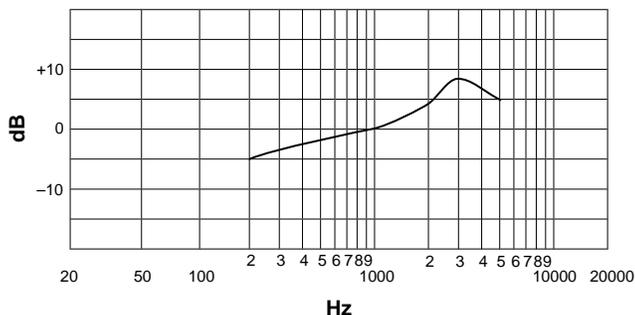
(Test conditions unless otherwise specified: audio output measured between pin 2 and ground; PTT switch depressed; no hang-up button connection; mic and DTMF level trimmers full clockwise; dc DMM 10 MΩ or greater input impedance; ac DMM 1 MΩ or greater input impedance. Test circuit as shown in Figure 3B.)

Type

Electret condenser (with transistor preamplifier, DTMF signaling circuitry, illuminated keypad)

Frequency Response

200 to 5,000 Hz (see Figure 1)



TYPICAL FREQUENCY RESPONSE
FIGURE 1

Polar Pattern

Omnidirectional

Output Level (at 1,000 Hz, 1 cm)

-26 dB/Pa (0 dB = 1 V/Pascal)

DC Supply Current

2.3 mA

Magnetic Hum Sensitivity

-94 dBV maximum in 1 Oe 60 Hz field (mic level control full counter-clockwise)

DTMF Output Level

1.1 V peak-to-peak

Audio Polarity

Positive sound pressure produces positive voltage at pins 2 and 6 of modular connector with respect to ground

Environmental Conditions

Operating Temperature: -30° to 60° C (-22° to 140° F)

Storage Temperature: -40° to 74° C (-40° to 165° F)

Relative Humidity: 0 to 95% (non-condensing)

Microphone Connector

6-conductor modular telephone type

PTT Switch Assembly

Mechanical: Double pole, single-throw, leaf-type, normally open

Electronic: Open NPN transistor collector to ground; positive polarity only; maximum on-state current 100 mA to produce 0.8 V or less; maximum off-state voltage 40 V.

Cable (optional choice)

Detachable, 1.4 m (48 in.), 5-conductor (1 shielded), vinyl-rubber-jacketed coil cord with modular plug on microphone end (see Cordset Table for available installed equipment plugs)

Construction

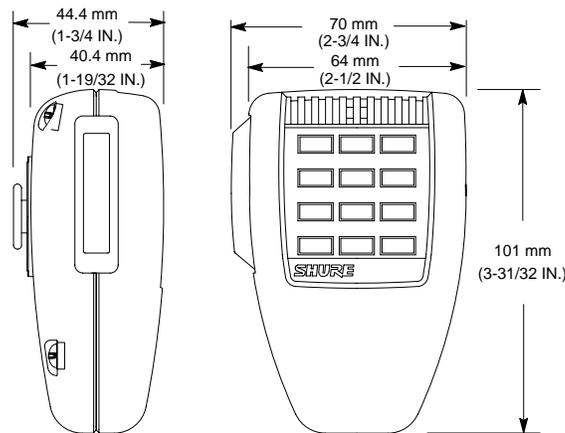
Case: Black textured high-impact ARMO-DUR

Switch Button: Black ARMO-DUR

Keypad: Molded silicone rubber

Dimensions

See Figure 2



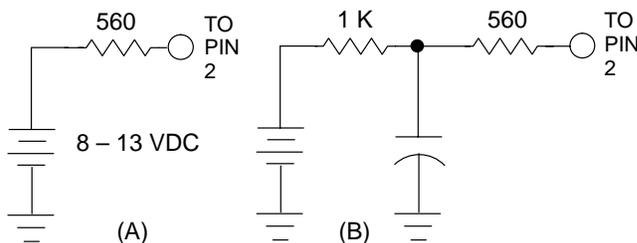
OVERALL DIMENSIONS
FIGURE 2

Net Weight

149 grams (5.2 oz)

CONNECTIONS

The 885TT is designed to operate with two-way radio sets with input circuits similar to those in Figure 3. When wiring ALM-1 cables with connectors for radios not listed in the table, modular connector pin 2 is to be used for the dc bias resistor on the input (see *Modifications* section).



MICROPHONE INPUT CIRCUITS
FIGURE 3

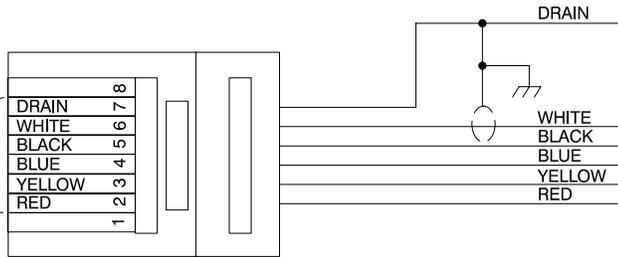
MOUNTING

The 885TT is provided with a rear-case hang-up button for use with a mounting bracket on or near associated equipment. Heavy-duty, chrome-plated mounting brackets are available in quantities of three as Shure Part No. RK6MB.

IMPORTANT: The microphone hang-up button is connected to the blue cable conductor for radios with microphone hang-up sensing.

MICROPHONE CABLES

The 885TT can be used with various MODULINK microphone cables. Each cable has a modular microphone plug on one end and the user's choice of equipment plugs on the other. The MODULINK Cordset Table supplied with the 885TT lists the most popular radios available and the cordset (ALM-) designed for use with each. Note that the ALM-1 has no connector on the equipment end; it can be wired as needed.



MODEL ALM-1 CABLE WIRING

FIGURE 4

MICROPHONE CONNECTOR WIRING

Pin	Color	Function	Pin	Color	Function
1	–	N.C.	5	Black	PTT Switch Ground
2	Red	Bias (+), DC Audio Out	6	White	Audio
3	Yellow	PTT Switch	7	Drain	Ground
4	Blue	Hang-up Button	8	–	N.C.

The cable is attached to the 885TT by inserting the modular telephone-type plug in the microphone jack until it locks. To remove the cable from the microphone, insert the small screwdriver supplied with the 885TT in rear case hole "A" just above the cable jack (see Figure 5) to unlock the plug and withdraw the plug from the jack.

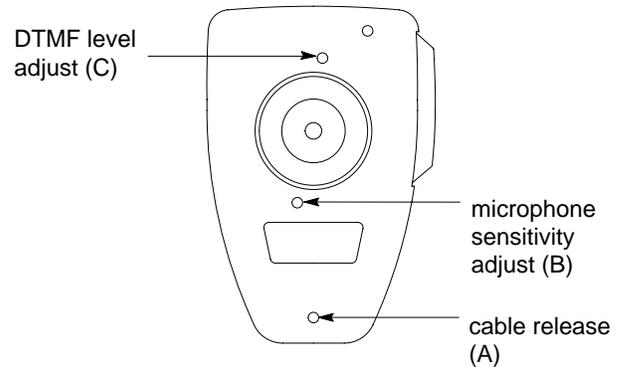
ADJUSTMENTS

After connection to the communications equipment and with equipment power turned on, the microphone sensitivity and DTMF output levels should be adjusted with the supplied screwdriver as follows.

- MICROPHONE SENSITIVITY:** Press the push-to-talk button and speak normally into the microphone while observing transmitter modulation. Adjust the microphone sensitivity control (rear case hole "B" in Figure 5) and repeat the talk test as required.
- DTMF OUTPUT:** Do not press the push-to-talk button. Depress and hold down a keypad button for a continuous tone. Adjust the DTMF output control (rear case hole "C" in Figure 5) as required.

OPERATION

Operation of all microphone and DTMF functions requires that the 885TT is connected to the communications equipment and that the equipment power is turned on. Power application can be verified by observing keypad LED backlighting.



MICROPHONE CASE REAR

FIGURE 5

Voice Transmission

- Hold the microphone comfortably in the hand, positioned so that the Top-Talk Sound Channels at the top of the case are near the mouth. The clearest sound is often obtained with the microphone at the corner of the mouth, with the cable away from the face.
- Press the push-to-talk button and make sure the equipment is in the transmit mode before speaking.
- Release the push-to-talk button before dialing.

Dialing

- Do not depress the push-to-talk button.
- Press the desired keypad buttons in sequence. A high-pitched tone will confirm that the code has been transmitted.
- When the first keypad button is pushed, the transmitter is automatically keyed. The transmitter will remain keyed for approximately 1.5 seconds after the button is released.

MODIFICATIONS

Certain applications require that the 885TT be internally modified. These modifications should be performed by qualified service personnel only.

CAUTION:

This microphone contains static-sensitive semiconductor devices. All work must be performed at a static-free work station using properly grounded equipment. Soldering operations must be performed using a fine-pointed, low-wattage soldering iron.

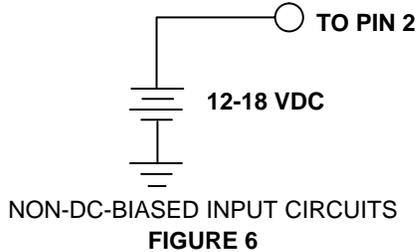
To perform internal modifications, disassemble the 885TT as follows.

- Turn the equipment power off.
- Remove the cable from the 885TT as previously described.
- Remove the four screws from the rear of the 885TT case.
- Holding the 885TT with the rear toward you and the cable connector downward, carefully remove the case rear from the front. Make certain the rear printed-circuit board does not become disconnected from the remaining boards attached to the case front. Carefully pivot the case rear to the right. Five wires remain attached between the printed-circuit boards (retained in the case front), and the switch and lug attached to the case rear. This exposes the solder side of the rear printed-circuit board.
- Perform the required modification.
- Carefully reassemble the case rear to the case front, guiding the front pin of the push-to-talk button into the round pivot recess of the case front. Reposition wires as necessary to make certain none are pinched between the case halves.
- Replace the four screws and reinstall the 885TT.

E.F. Johnson and Other Unpowered-Microphone-Input Radios

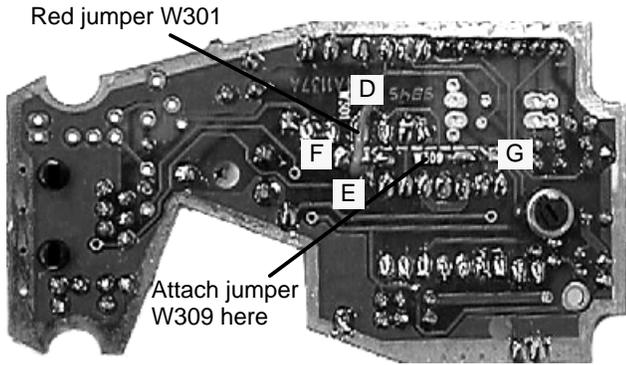
Certain radios such as those manufactured by E.F. Johnson do not have biased audio, that is, there is no power on the audio line (see Figure 6). For radios with this type of input, the audio output must be wired to pin 6 (not pin 2) of the 885TT's modular connector. This is accomplished by using the red lead (normally the powered audio lead) for power only and the white lead for audio, and moving jumper D-E (see procedure below). This places a bias resistor and noise filter in the mic circuit.

IMPORTANT: To avoid permanent damage to the 885TT, this modification *must* be performed before using the 885TT with any equipment listed in the MODULINK Cordset Table as requiring it.



1. Open the microphone as described in the "Modifications" paragraph above.
2. Locate red jumper wire (W301) connected between points "D" and "E" as shown in Figure 7.
3. Using diagonal cutting pliers, clip and remove this wire from both points.
4. Solder a jumper wire (W309) between locations "F" and "G" as shown in Figure 7.
5. Reassemble the microphone.

NOTE: This type of radio normally handles a low-level mic signal; use of the 885TT will probably require that the audio and DTMF gain controls be turned down.



**885TT REAR CIRCUIT BOARD
JUMPER LOCATIONS
FIGURE 7**

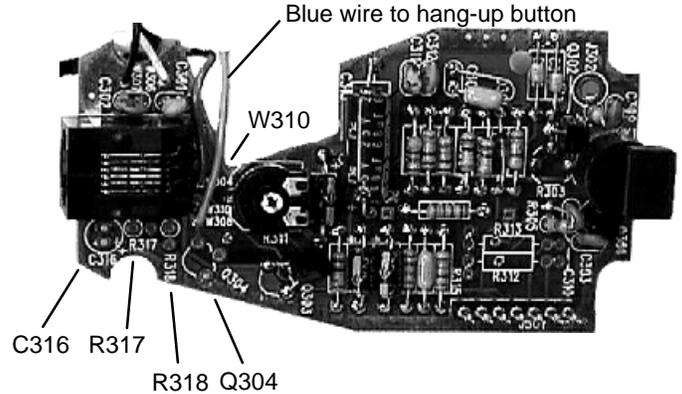
Radios with Inverted Logic

Certain radios such as those manufactured by Ericsson have a positive-going circuit when the mic is on-hook. The logic of the 885TT can be inverted for compatibility with these radios as follows:

1. Add the following components to the rear circuit board in the positions shown in Figure 8.

PART	VALUE	TYPE
Q304	86A350	NPN Transistor
C316	10 μF 35 wvdc	Electrolytic Capacitor
R317	100K	1/4 W 2% Resistor
R318	1K	1/4 W 2% Resistor

2. Disconnect the blue wire from location W308 and connect it to W310. See Figure 8.



**885TT REAR CIRCUIT BOARD
LOCATIONS FOR LOGIC-INVERTING MODIFICATIONS
FIGURE 8**

REPLACEMENT PARTS

Keypad	RK269
Membrane Switch Assembly	RK270
Leaf Switch Assembly	RK271S
Cable and Modular Plug	See Cordset Table

FURNISHED ACCESSORY

Screwdriver	80B498
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OPTIONAL ACCESSORY

Mounting Bracket (3 in kit)	RK6MB
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INFORMATION TO USERS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, and as set out in the Radio Interference Regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the microphone and receiver.
- Connect the microphone transmitter to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



SHURE Incorporated Web Address: <http://www.shure.com>
 222 Hartrey Avenue, Evanston, IL 60202-3696, U.S.A.
 Phone: 847-866-2200 Fax: 847-866-2279
 In Europe, Phone: 49-7131-72140 Fax: 49-7131-721414
 In Asia, Phone: 852-2893-4290 Fax: 852-2893-4055
 Elsewhere, Phone: 847-866-2200 Fax: 847-866-2585