

Controlled Magnetic Transistor Amplifier Hand Microphone

General: The Model 405T microphone is a controlled magnetic type unit intended to replace carbon microphones in mobile communication equipment without circuit changes. An outstanding feature incorporated in this unit is a TRANSISTOR AMPLIFIER within the case, powered by the current available from the carbon microphone circuit, making the Model 405T directly replaceable for carbon microphones. The 405T does not require batteries or extra power-supplies. The Microphone is free from carbon hiss and ageing common to carbon microphones used under conditions of vibration.

This microphone was designed for clear, crisp, natural voice reproduction of high intelligibility. The response-frequency characteristic is from 200 to 4000 Hertz. The unit is not affected by operating or storage temperatures up to 74°C. (165°F.). The 405T has withstood relative humidity tests of 95% at 49°C. (120°F.), providing an unusual dependability of performance.

The microphones fit naturally and comfortably in the palm of the hand—retaining a natural feel when the weather varies from hot to cold. The sturdy high impact "armodur" case is light and compact and takes minimum space in portable equipment. It is both lighter and stronger than die-cast metal cases—proved through critical laboratory and severe field tests.

The Model 405T Microphone is equipped with a heavy duty push-to-talk switch, designed to withstand severe operating conditions and constant usage.

Application: Model 405T Microphones are especially recommended for mobile communications where carbon microphones have been in use, i.e., military, police, marine, aircraft, taxicab, ham, etc., where intelligibility and long life are important, or where vibration or noise conditions require the use of a non-carbon microphone.

The output signal, due to the TRANSISTOR AMPLIFIER, is sufficient to permit the use of moderately long lengths of unshielded cable.

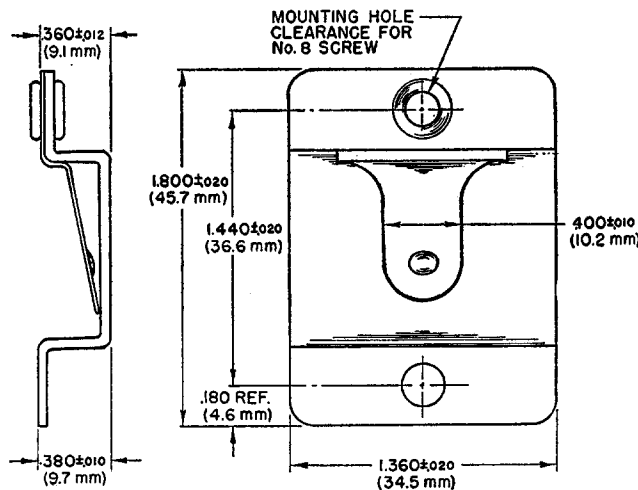


FIGURE A

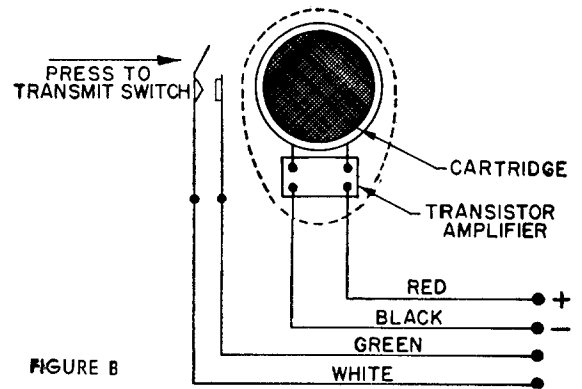


Furnished Accessory: The microphone is provided with a 94A242 bracket for permanent placement with the associated equipment. The bracket has mounting holes with clearance for No. 8 screws. (See figure A).

Replacement Components:

- Model C15C Coiled Cord
- Model R5B Cartridge

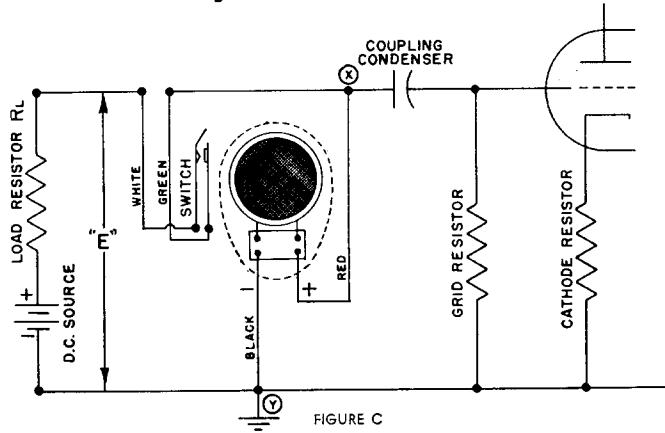
Connections: Internal connections of Model 405T are shown in Figure B.



INTERNAL CONNECTIONS

Model 405T uses a four-conductor, non-shielded cable. Two conductors are connected to the single-throw type switch to control an external relay or switching circuit. The red and black conductors are attached to the TRANSISTOR AMPLIFIER and should terminate into a load and source voltage.

Basic Operating Circuits: A basic operating circuit is shown in Figure C.



BASIC OPERATING CIRCUIT

The Model 405T can be used over a range of resistive loads from 100 to 500 ohms; however, the applied D.C. voltage "E" to the TRANSISTOR AMPLIFIER (across points X and Y with the switch closed) MUST NOT EXCEED 12 VOLTS. EXCESSIVE VOLTAGES MAY SUBSTANTIALLY REDUCE THE LIFE OF THE MICROPHONE. D.C. VOLTAGES LESS THAN 2½ VOLTS MUST NOT BE USED AS THE TRANSISTOR AMPLIFIER MAY BECOME INOPERATIVE.

Caution: It is imperative that the Model 405T Microphone be in the operating circuit at the time the microphone input voltage is measured.

It is also of great importance to follow the proper schematic polarity as shown in Figure C, or TRANSISTOR AMPLIFIER WILL BECOME INOPERATIVE.

In mobile communication equipment installed in automobiles, verification of battery polarity is very important.

Upon examination of the basic circuit (Fig. C), it will become apparent to the user that the D.C. Source Voltage can be replaced by an equivalent D.C. Power Supply Voltage Divider equipped with suitable by-pass condenser "C" as shown in Figure D.

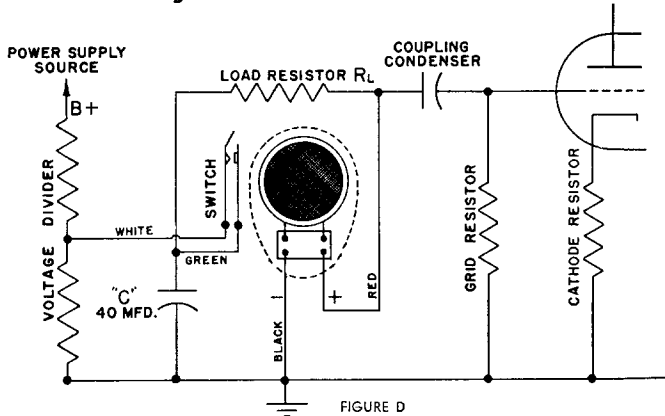


FIGURE D

As the Model 405T is designed to be interchangeable in circuits utilizing carbon microphones, a typical carbon microphone circuit is shown with the 405T Microphone substituted. (See Figure E). Figure F is the same basic carbon microphone circuit as Figure E except that the Power Supply Voltage Divider is utilized as in Figure D. Herein, the voltage divider constitutes a voltage source and current limiting resistor. It will also be evident that RL has been replaced by the transformer primary.

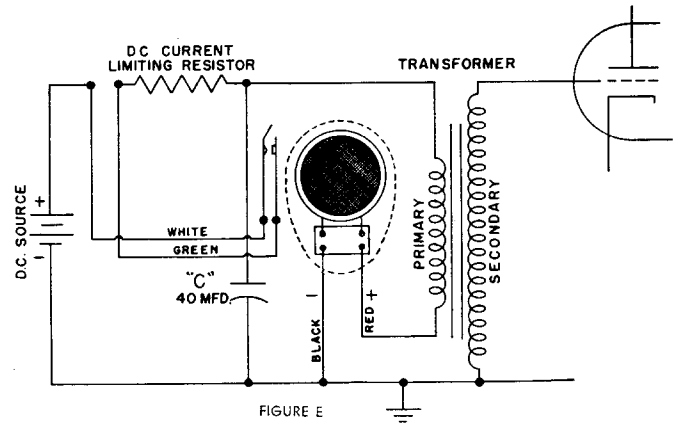


FIGURE E

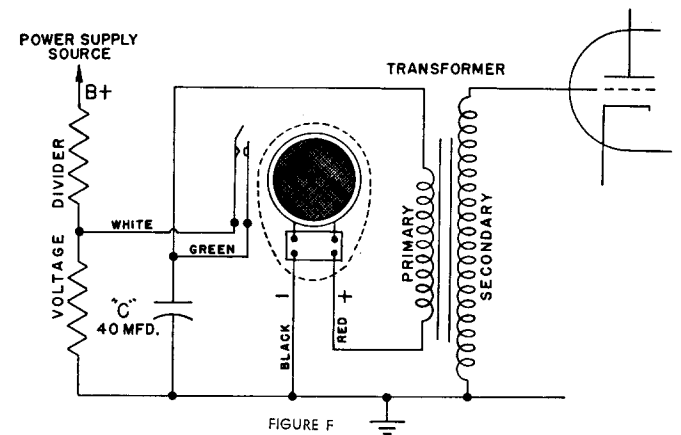


FIGURE F

Operation: No special precautions beyond ordinary care are necessary in the operation of the Model 405T microphone. The 405T will operate satisfactorily under all ordinary conditions of humidity, heat and cold. (See GENERAL:) Dropping the microphone or other severe mechanical shocks should be avoided.

MODEL 405T REPLACEMENT DATA AND SCHEMATICS

The Model 405T may be used with practically all equipment currently using carbon microphones.

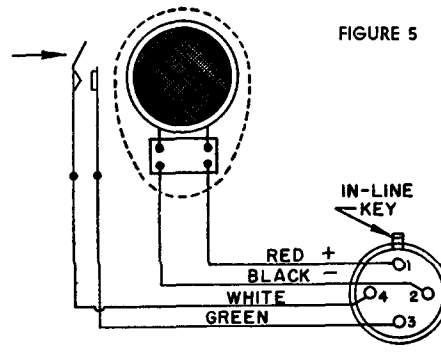
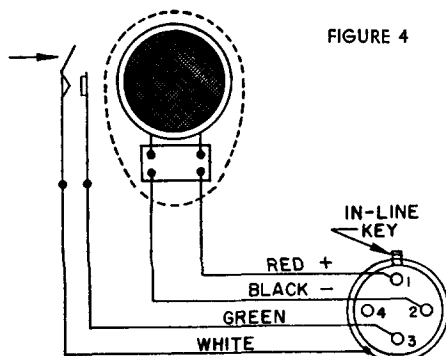
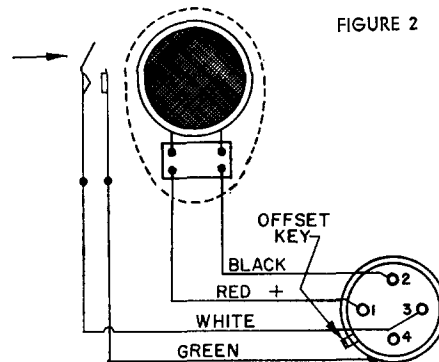
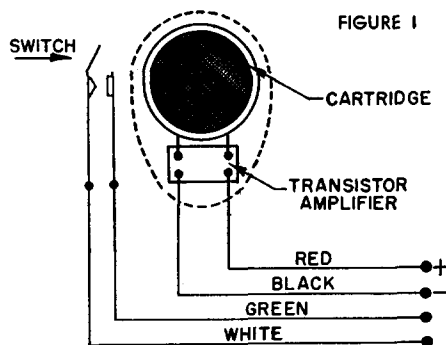
Listed below are several equipment manufacturers, the Shure microphones used by them, and the recommended wiring instructions for using the Model 405T as a replacement for these units.

Equipment Manufacturer	Shure Carbon Microphone Model No. Used	Equipment Manufacturer Model No.	Method of Wiring Model 405T Replacement Microphone to Match Original Installation
General Electric	CB10B	4MKA2A2	Attach Amphenol MC4M plug as shown in Fig. 2.
General Electric	CB10D	4MKA2A4	Attach Amphenol MC4M plug as shown in Fig. 2.
General Electric	CB10E	4MKA2A5	Attach Amphenol MC4M plug as shown in Fig. 2. (offset keying).
Motorola	CB12D	59B84298 & Kit No. P255A	Attach Amphenol MC4M plug as shown in Fig. 5
Motorola	CB12E	50B890923	Attach Spade Lugs. See Fig. 1.
Motorola	CB12F	50C822727	Attach Amphenol MC4M plug as shown in Fig. 4.
R.C.A.	CB15D	MI-31544	Attach Spade Lugs. See Fig. 1.
R.C.A.	CB15F	MI-31544A	Attach Amphenol MC4M plug as shown in Fig. 5.

NOTE:

Model 405T has a stranded coil cord cable. The Shure Model C15C may be used as a replacement cable.

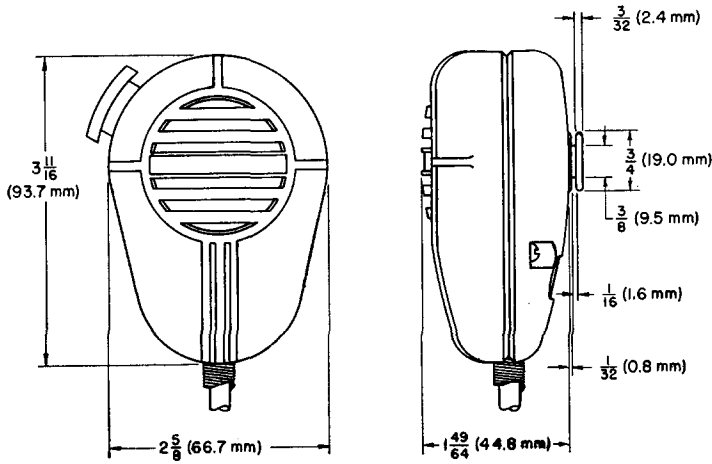
For proper replacement of the Model 405T in special installations of the Shure Jobber Model Numbers 101C, 102C, 102E refer to Figure 1 and for replacement of 101E see Figure 2.



PLUGS INDICATED ARE BOTTOM VIEWS

SPECIFICATIONS:

MODEL 405T	
Dimensions	See Fig. H
Net Weight	3/4 lb. (340.2g)
Shipping Weight	1 lb. (453.6g)



Model 405T

- Voltage Output with 100 ohm load.....—18.0 db*
- Power level into 100 ohms.....— 8.0 db**
- Voltage Output with 500 ohm load.....— 4.0 db*
- Power level into 500 ohms.....— 1.0 db**

* O db = 1 volt with 100 microbars
 ** O db = 1 milliwatt with 100 microbars
 1 microbar = 1 dyne per square centimeter
 Recommended Load = 500 ohms
 Recommended Applied Voltage = 6 volts
 (See Fig. C at points X and Y with the 405T in the circuit)

Voltage output and Power level as listed above.

Guarantee: This Shure product is guaranteed in normal use to be free from electrical and mechanical defects for a period of one year from the date of purchase. Please retain proof of purchase date. This guarantee includes all parts and labor.

Shipping Instructions: Carefully repack the unit and return it prepaid to the factory. If outside the United States, return the unit to your dealer or Authorized Shure Service Center for repair. The unit will be returned to you prepaid.

