

DATE: April, 1939

SUBJECT: Models 50A, 50B, 50C  
 "Rocket" Dynamic Microphones

50 Series "Rocket" Dynamic Microphones

**GENERAL:** Models 50A, 50B, and 50C are pressure dynamic microphones with wide-range frequency response and typical semi-directional pickup characteristics. The three models differ only in output impedance as described under "Connections" below.

The microphones operate on the principle of a moving-conductor in a magnetic field. A high flux magnet is used in the magnetic circuit, which together with a specially designed moving system and associated acoustic network, provides high efficiency and smooth peak free response.

The case is attractively streamlined for improved acoustical performance and for modern appearance. Each microphone is provided with a built-in receptacle and shielded rubber jacketed cable with microphone plug attached.

**APPLICATIONS:** Models 50A, 50B and 50C are suitable for public address, recording, call systems, communications radio telephone equipment, and similar applications. Extreme ruggedness and immunity to severe temperature and humidity conditions are inherent in the design. The frequency response characteristic is wide range (see Fig. B) providing high quality reproduction of sound from 70 to 7,000 cycles. The pickup characteristic is of the conventional semi-directional type. (See "Acoustic Considerations"). A swivel is provided which permits pointing the microphone toward the source of sound. A removable directional baffle (Model A91A) is available for the 705A which increases discrimination against high-frequency sounds coming from the rear. When turned to the vertical position (without baffle) the microphone becomes non-directional in the horizontal plane and artists may be placed all around it without frequency discrimination.

**INSTALLATION:** All microphones have the standard 5/8"-27 thread and may be mounted on any Shure desk, banquet, or floor stand. Shure floor stands are especially recommended because of the effective isolation against floor vibration which they provide. For overhead suspension, an A35B Suspension Adapter may be used.

**CONNECTIONS:** Due to the very low impedance of the moving conductor, all models include an internal high-quality vacuum-impregnated transformer with high permeability core. The output impedances and cables furnished with the three models are listed below:

Model	Impedance	Cable
50A	35-50 ohm	25 ft. two-conductor
50B	200-250 ohm	25 ft. two-conductor
50C	high impedance	25 ft. single-conductor
50C-7FT	high impedance	7 ft. single-conductor

Low impedance models 50A and 50B are recommended where long cable lengths are required. The permissible line length is practically unlimited since neither the level nor the frequency response is appreciably affected by reasonable lengths of line. As shown in the table below the cable loss is very small. When long lines are used, care should be taken that the cable does not parallel A.C. power lines for long distances to avoid A.C. hum induction.

Cable Length	Loss in Level*	Loss in Level*
	Model 50A	Model 50B
25 ft.	0 db	0 db
250 ft.	0.4 db	0 db
500 ft.	0.8 db	0.2 db
1000 ft.	1.6 db	0.4 db
2000 ft.	2.9 db	0.7 db

(\* Based on 2-conductor #20 equivalent, twisted and shielded)

Low impedance models 50A and 50B may be fed into a standard low impedance input amplifier (as shown in Fig. A-3) or into an amplifier with high impedance



input (Fig. A-2). In the latter case Shure Model A86A Cable-Type Transformer is available for coupling the low impedance line to amplifier. The double-winding primary permits coupling a 35-50 ohm line or 200-250 ohm line to the high impedance input of the amplifier.

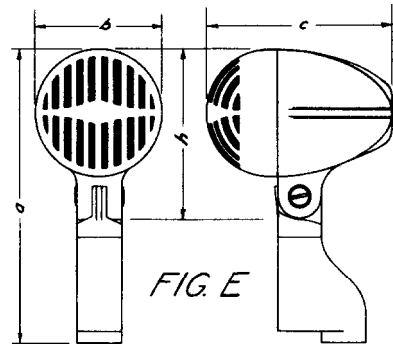
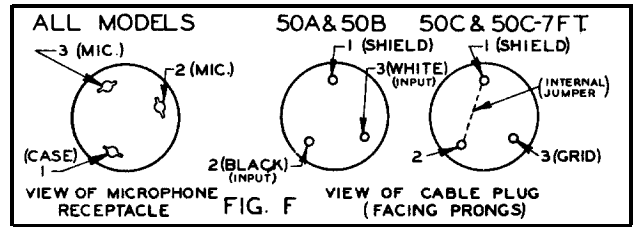
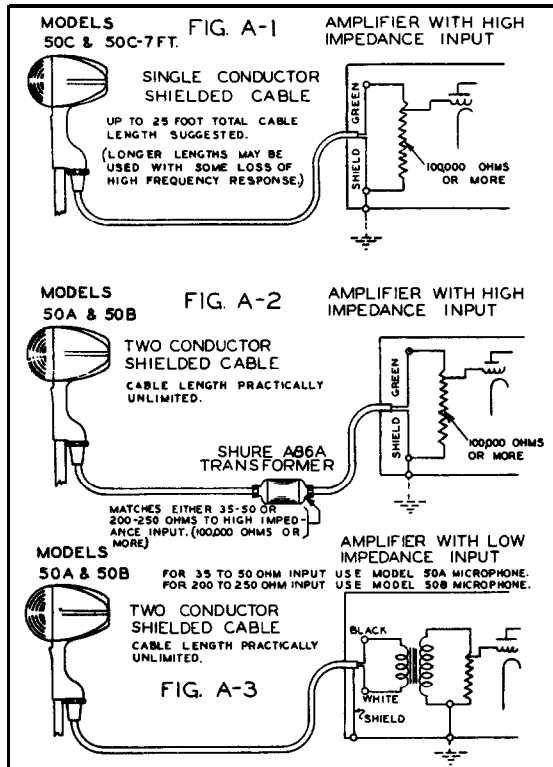
High impedance model 50C (or 50C-7FT.) may be used with any crystal microphone amplifier or other amplifier with an input impedance of 100,000 ohms or more (see Fig. A-1). For best high frequency response the total cable length should not exceed 25 feet; longer cable lengths may be used with some loss of high frequency response. The additional loss at 5,000 cycles is of the order of 2.5 db for an additional 25 ft. length of cable (50 ft. total) and 6 db for an additional 50 foot length (75 ft. total).

**OPERATION:** No special precautions beyond ordinary care are necessary in the operation of 50 Series Dynamic microphones. They will operate efficiently and dependably under all ordinary conditions in hot and cold climates. To retain the full strength of the highly efficient permanent magnet and to maintain alignment of structure, dropping or other severe mechanical shocks should be avoided.

**ACOUSTIC CONSIDERATION:** A frequency response curve typical of all models is shown in Fig. B. The smooth wide-range characteristic is excellent for high-quality reproduction of music and speech. 50 Series microphones may be termed semi-directional with polar characteristic as shown in Fig. C. Note the smooth contours at all frequencies, due to acoustic streamlining. The pickup angle is unusually wide; it is permissible to include the sources of sound within an angle of approximately 140° at the front of the microphone without introducing appreciable frequency discrimination.

The addition of the A91A Directional Baffle increases the discrimination against high frequency sounds coming from the rear of the microphone, thus decreasing feedback tendency and cutting down high frequency room noise pickup. (See Fig. D.) In cases where this type of discrimination is not sufficient, a true uni-directional microphone, which will provide marked directional discrimination throughout the entire audio frequency range, is recommended. Sure Models 55A, 55B and 55C "Unidyne" Uni-directional Dynamic Microphones, or the 730A "Uniplex" or 720B "Tri-Polar" Crystal microphones are suggested.

When turned to the vertical position, the microphone is substantially non-directional in the horizontal plane.



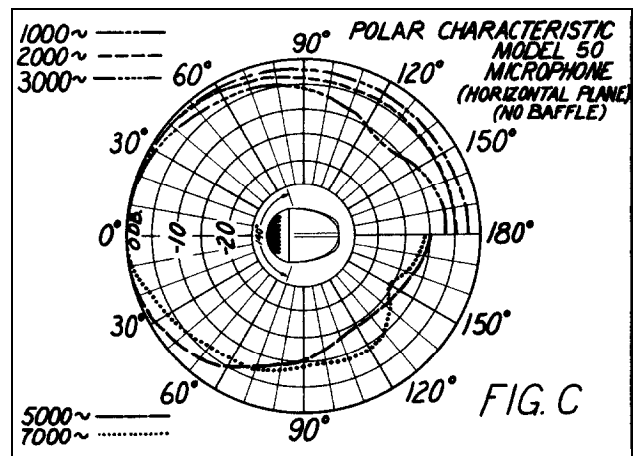
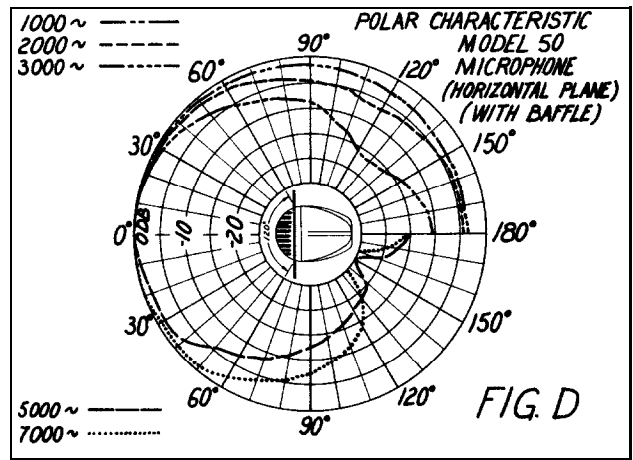
**SPECIFICATIONS**

Voltage Sensitivity:

- Model 50A** 91 db below 1 volt per bar open circuit at 400 cycles. This is closely equivalent to 67 db below 6 milliwatts for 10 bar signal when loaded with 35 to 50 ohms.
- Model 50B** 82 db below 1 volt per bar open circuit at 400 cycles. This is closely equivalent to 67 db below 6 milliwatts for 10 bar signal when loaded with 200 to 250 ohms.
- Model 50C** 63 db below 1 volt per bar when loaded with 100,000 ohms or more. This is equivalent to 0.7 millivolts per bar across 100,000 ohms or more.

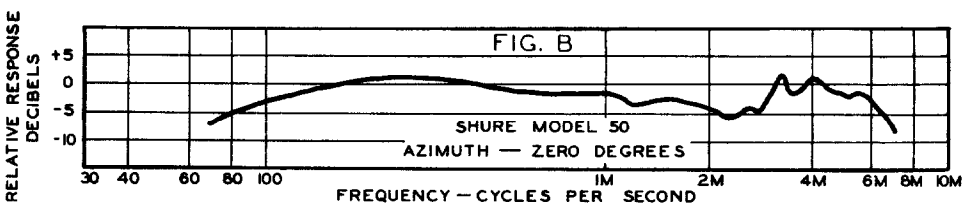
Recommended Load Impedance:

- Model 50A 35 to 50 ohms
- Model 50B 200 to 250 ohms
- Model 50C 100,000 ohms or more.



Model	50A and 50B	50C	50C-7FT.	A91A Baffle
List Price . . . . .	\$27.50	\$27.50	\$26.00	\$ 2.50
Net Weight, Less Cable. . . . .	1½ lb.	1½ lb.	1½ lb.	2 oz.
Shipping Weight. . . . .	2½ lb.	2½ lb.	1½ lb.	6 oz.
Cable. . . . .	25. ft. two conductor	25. ft. single conductor	7 ft. single conductor	. . . . .
Code Word. . . . .	RUDAD RUDAG	RUDAC	RUDAB	RUBAB
Height, overall (a)*	5½"			
Height, case (h)*	3-3/16"			
Width (b)*	2-3/8"			
Thickness (c)*	3-7/16"			
Finish . . . . .	satin chrome			Alumilite

\* See Fig. E.



**GUARANTEE:** Each microphone is guaranteed to be free from electrical and mechanical defects for a period of one year from date of shipment from the factory, provided all instructions are complied with fully. In case of damage, return the microphone to the factory for repairs. Our guarantee is voided if the microphone case is opened.