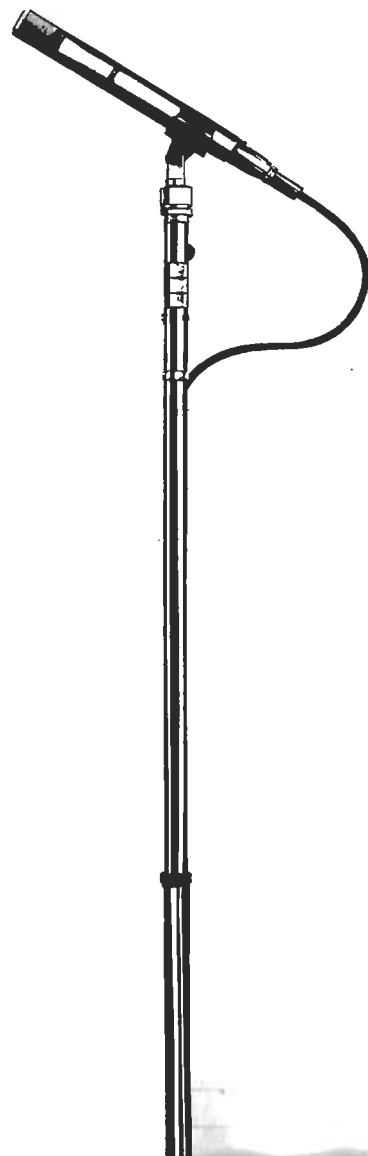


**SONY®**

**ELECTRET CONDENSER MICROPHONE**

**ECM-22P**

**INSTRUCTION MANUAL**



**SONY CORPORATION**

The newly designed SONY ECM-22P electret condenser microphone is a high performance microphone perfectly suited to the requirements of recording and broadcast studios, public address, sound reinforcement and other professional or semi-professional applications.



## FEATURES

### Professional Quality

The superb cardioid capsule provides wide acceptance angle and wide frequency range. Its excellent directivity rejects unwanted background noise, and a specially developed low noise FET (Field Effect Transistor) contained in the IC (Integrated Circuit) make this microphone highly desirable for use in the most difficult and demanding situations.

### Excellent Sensitivity

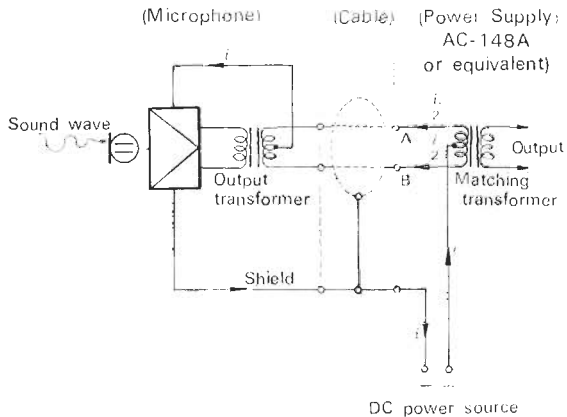
The diaphragm of the capsule of the ECM-22P is made of a special high polymer plastic film in which a permanent state of electrostatic polarization has been imprinted. This extremely light weight diaphragm provides very high sensitivity while remaining virtually impervious to overload.

### Unique Powering System

Besides battery operation, ECM-22P can be operated on an external DC power supply without any additional conductors or cables.

## POWERING SYSTEM OF THE ECM-22P

The ECM-22P is designed for phantom powering (DC 8.4V-54V) as well as internal battery power. The phantom power system consists of a DC power source, the standard two-conductor microphone cable, and the center-tap transformer of the ECM-22P. (SONY Power Supply AC-148A is recommended as an optional accessory).



In this form of powering, the supply current (positive potential) is fed to the center tap of the power supply transformer, and is conducted symmetrically via the A and B conductors whose original function is to carry the microphone output signals. Then this voltage is fed to the center tap of the microphone transformer. (See illustration above.) The negative potential is sent through the shield, back to the powering source. The powering DC voltage is completely isolated from the output signal of the microphone, so that it does not affect the signal.

This powering system offers following conveniences:  
**Interchangeability with other types of microphones**  
The outlet of the power supply transformer may be connected to any other type of microphone... condenser, dynamic, ribbon, etc...without causing noise interference or deterioration of the signal, since no voltage difference occurs between the A and B conductors. Improper polarity connections of A and B conductors will not affect operation of the ECM-22P.

## Simplified microphone set-up

Once the power supply and matching transformer are set-up, the ECM-22P is as convenient to use as any dynamic or ribbon microphone. There are no complicated power supply connections and no need to worry about a battery failure while the microphone is in use.

### Note:

When an external power supply with phantom powering system is used, never use unbalanced-type cable to connect a microphone.

### Maximum versatility

In permanent or semi-permanent studio installations the phantom powering system will, of course, be preferable to battery operation. However, the ECM-22P is not limited to use where AC power is available and may be battery powered for in-the-field applications. Thus the ECM-22P offers condenser microphone performance with the versatility of a dynamic microphone.

475-6836.



## CONSTRUCTION AND PRINCIPLE OF THE ELECTRET CONDENSER MICROPHONE

Condenser microphones use the principle of converting the difference of static capacitance between the diaphragm and the backplate, which is an air space, into the difference of an electrical signal. Conventional condenser microphones consist of the following:

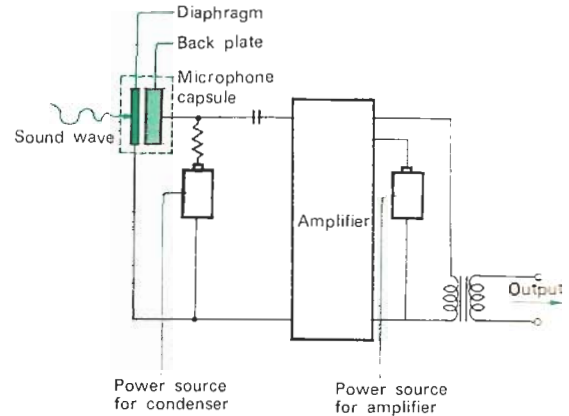
1. A condenser capsule that converts sound pressure to an electric voltage.
2. An impedance translator (amplifier or pre-amplifier) that converts the signal from the condenser capsule to a usable output impedance.
3. A DC power source to supply the polarization voltage to the condenser capsule and a second DC power source to supply voltage to the impedance translator (FET amplifier).

The electret condenser microphone does not require a power source to maintain a polarization charge at the capsule, because the diaphragm has been permanently charged and can be looked at as a condenser capsule with a built-in voltage. Because only a single power source to power the FET impedance translator is required, the current requirements of the entire microphone package are minimal (on the order of 100 to 200 micro-Amps).

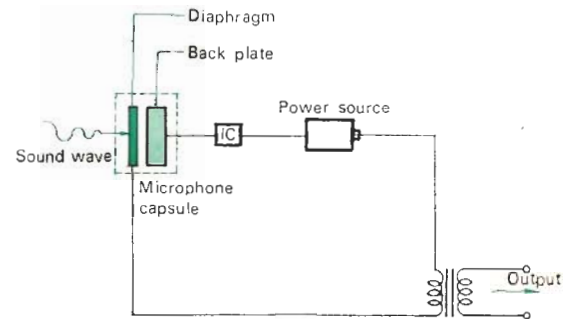
Because the power source for the condenser capsule is eliminated, extreme miniaturization is now possible.



Ordinary Condenser Microphone



Electret Condenser Microphone



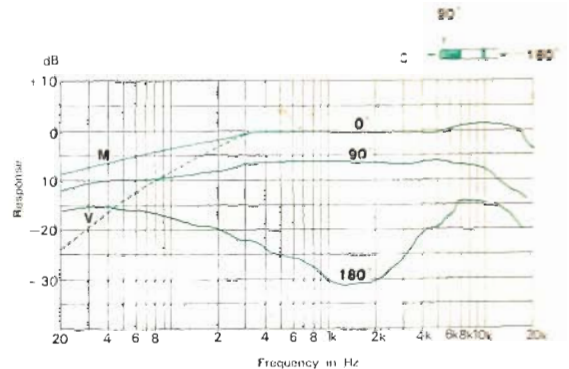
## SPECIFICATIONS

<b>Type</b>	Electret Condenser Microphone ECM-22P		
<b>Capsule</b>	Electret capsule		
<b>IC</b>	Monolithic IC		
<b>Battery</b>	EVEREADY No. 206 or No. 523 dry battery (9V), No. E-126 mercury battery (8.4V) or equivalent		
<b>Microphone Cable</b>	0.205" dia. (5.2mmdia.) 2 conductor cadmium bronze cable, 20 ft (6m)		
<b>Frequency Response</b>	20-20,000Hz		
<b>Directivity</b>	Uni-directional (Cardioid)		
<b>Output Level</b>			
<b>Output Impedance (ohms)</b>	Effective output level (dBm)*1	Open circuit voltage (dB)*2	EIA rating GM (dB)*3
250	-54.6	-54.8	-146.6
600	-54.8	-51	-148.8
	*1 Deviation $\pm 3$ dB		
<b>Note</b>	*1 0dBm=1mW, 10 $\mu$ bar *2 0dB=1V/10 $\mu$ bar *3 EIA Standard SE-105		
<b>Output Impedance</b>	250 ohms, 600 ohms at 1,000 Hz balanced		
<b>Power Supply</b>	Normal operating voltage 4-9V Minimum operating voltage 3.7V Accepts external power supply of DC 4.5V-54V Current drain approx. 0.6 mA Battery life: E-126 approx. 1,000 hours No. 206 approx. 500 hours		
<b>Noise Level</b>	S/N ratio; 64 dB (1,000 Hz, 10 $\mu$ bar) Inherent noise; less than 30 dB SPL Wind noise*1; 45 $\pm$ 5dB SPL Induction noise of external magnetic field *2; less than 5 dB SPL/m gauss		
<b>Note</b>	*1 Wind noise is the value measured by applying a wind velocity of 6.6 ft/second from all directions to the microphones. The mean value is taken and converted to the equivalent input sound level. (0 dB=2 $\times$ 10 $^{-4}$ $\mu$ bar) *2 The external magnetic field induction noise is measured with the microphone placed in the alternating magnetic field of 50Hz, 1 milligauss. The maximum noise value is taken and then converted to the equivalent input sound level. (0 dB=2 $\times$ 10 $^{-4}$ $\mu$ bar)		
<b>Maximum Sound Pressure Input Level</b>	124 dB SPL		
<b>Dimensions</b>	0.96" $\phi$ $\times$ 7.7" (24.5mm $\phi$ $\times$ 195mm)		
<b>Weight</b>	3.9 oz (110 g) without cable		
<b>Supplied Accessories</b>	Microphone cable Wind screen Microphone holder (1/2") Stand adaptor (1/2" to 5/8")		

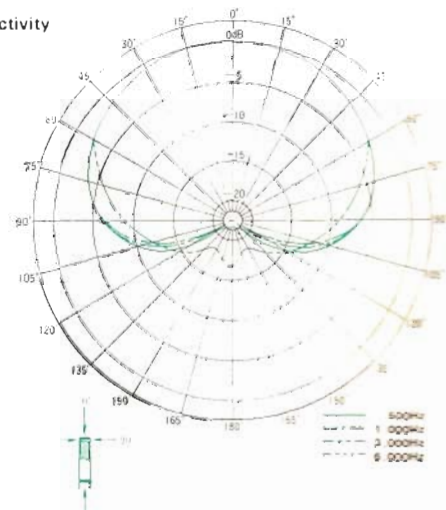
Keep the microphone away from extreme temperature (above 104°F, 40°C)

Design and specifications subject to change without notice.

Frequency Response



Directivity



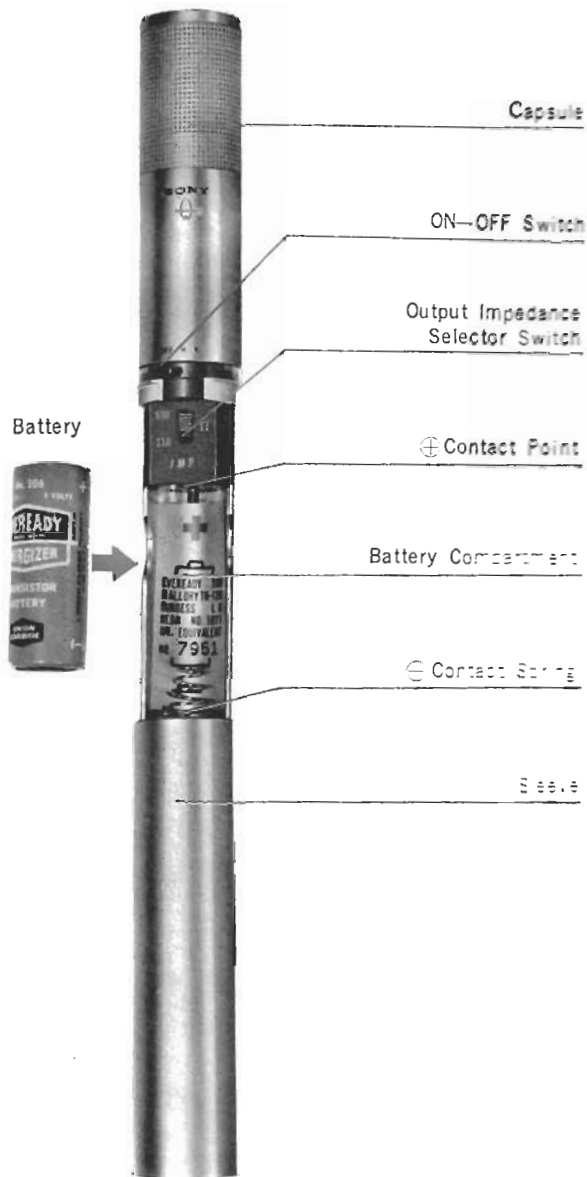
## BATTERY INSTALLATION

This microphone requires a standard 9 volt battery or a mercury battery (8.4V), such is usually used in pocket radios. The power consumption of battery is only 0.6mA, so the battery will last for long periods of time.

- 1) Disconnect the microphone cable connector from the microphone. Turn the bottom half of the microphone counterclockwise and remove the sleeve. If the sleeve cannot be turned, proceed as follows: Connect the microphone cable connector and turn the sleeve counterclockwise holding the connector. Then, disconnect the connector and remove the sleeve.
- 2) Insert a new battery into the battery compartment, pressing the negative (-) side of the battery against the spring contact.
- 3) Replace the sleeve, and fasten it by turning clockwise.

### Notes:

- 1) When the battery is exhausted, it will cause distortion at high sound levels. When this occurs, replace the battery.
- 2) If the terminal voltage of the battery is less than 4V, the microphone will become inoperative.
- 3) If the microphone is not used, or operated on an external power supply voltage for a long period of time, remove the battery to prevent any possibility of corrosion.

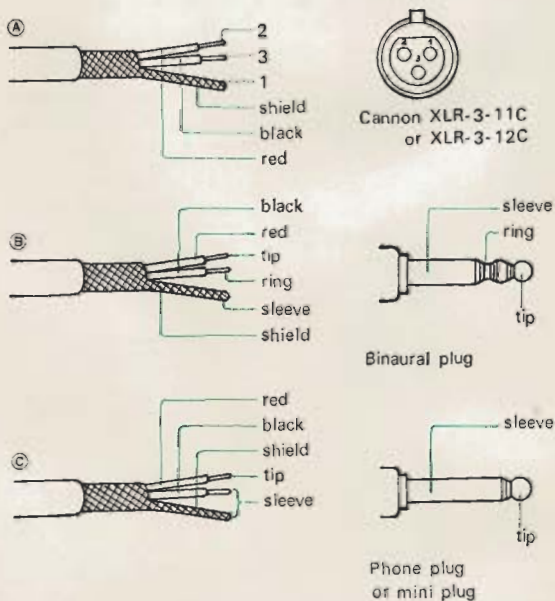


## MICROPHONE CABLE

Insert the cannon plug (XLR-3-11C) of the microphone cable into the ECM-22P. Attach a plug which fits the input equipment to the other end of the cable.

There are two basic types of connections; balanced to ground and unbalanced to ground, depending on the equipment with which the microphone is used. Figures A and B show balanced connection and Figure C shows unbalanced. Usually, for a home tape recorder, use the unbalanced configuration. If you have any troubles regarding plug connection, ask your SONY dealers.

The microphone cable is 20 feet long. If a longer cable is necessary, an extension cable up to 200 feet may be used without affecting sound quality or performance.

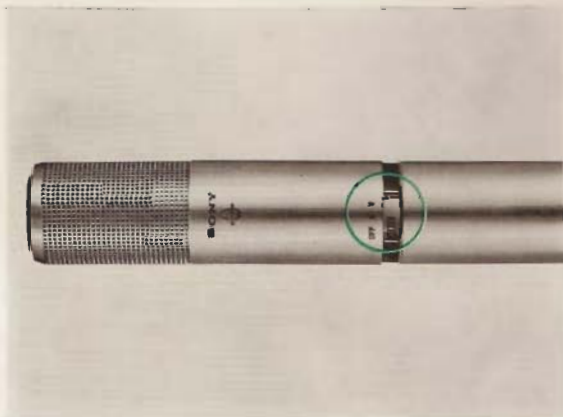


## OUTPUT IMPEDANCE

Two output impedances: 250 and 600 ohms can be selected by the output impedance selector switch above the battery compartment. Set the switch to the input impedance required for your equipment. If you are not sure, test the tone quality and output level of each impedance. Then set the switch to the most desirable impedance. If a SONY consumer type tape recorder is used, the impedance of 600 ohms usually matches. In this case, the microphone cable should be wired in the unbalanced configuration.

## ON-OFF SWITCH

When the microphone is to be used, shift the On-Off switch to V (voice) or M (music) position. On V position, bass is extremely attenuated. This is desirable for close-micing of voice or in situations where air-conditioner rumble or other low-frequency ambients are encountered. Usually M position is used for music programs, but in places where room acoustics emphasize low frequencies, the excellent bass response may cause boomy sound pick-up. In this case, set the switch to V position even when you record music programs. After using the microphone, return the switch to OFF position.



## WIND SCREEN

The wind screen does not degrade performance in any way and should be used at all times. It will prevent "pops" when picking up voice and will reduce wind noise in outdoor applications. The wind screen also protects the capsule from shock, moisture, and dust. For even greater protection SONY Wind Screen Model AD-40 (optional) is recommended.



## MEMO