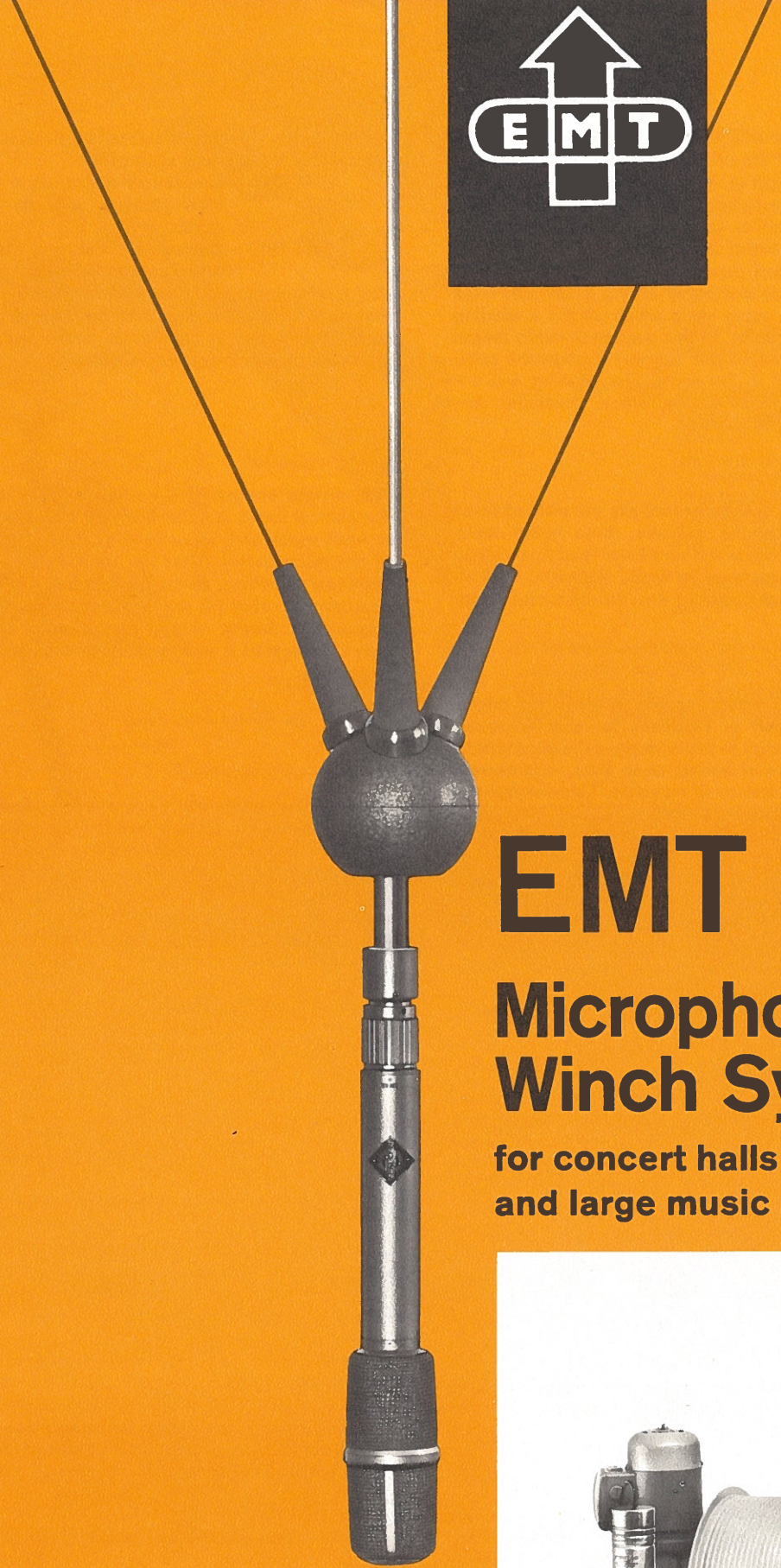
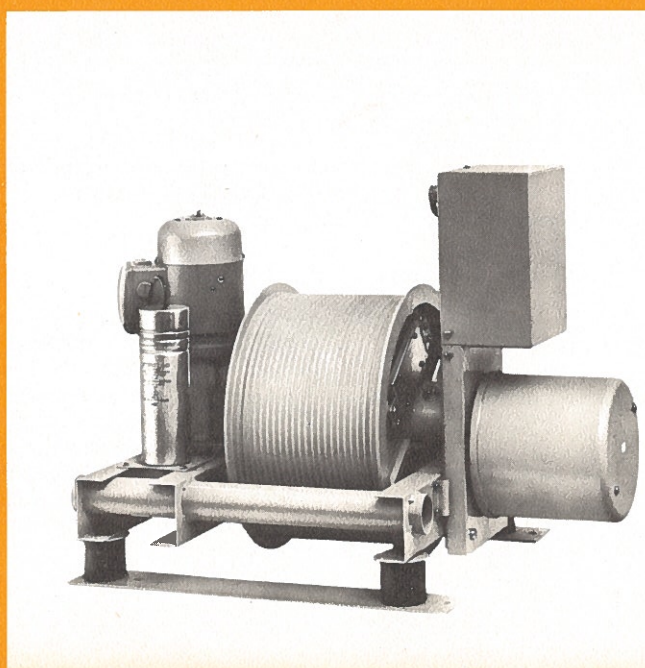


EMT 924

Microphone Winch System

for concert halls and large music studios



Principle of Operation

A microphone which is attached and suspends from three cables can be moved three-dimensionally in a room by changing the cable length of the corresponding cables.
The cables form a three-sided pyramid, whereby the lowermost end of these cables form the tip of the pyramid. The microphone is mounted to the tip of the pyramid. The three cables are guided through guide openings in the ceiling of the room, are deflected at the guide openings and are mounted onto cable reels which permit a winding and unwinding of the cables. In this way, each cable length can be individually changed and thereby change the position of the microphone in the room. The winding and unwinding operation is carried out by remote controlled motors which drive the cable winches.

The Microphone Winch System

The microphone winch system essentially consists of three motor operated microphone winches, three cable reels, three cables-one of which is the electrical lead line-, a ball joint in which the microphone is freely movable, thus always being in a vertical position, and the necessary control panel.

Field of Application

The microphone winch system serves to move the microphone either horizontally or vertically (or simultaneously horizontally and vertically) in order to move the microphone optimally to the source of sound, or to keep it in correct distance if the sound soucre is movable. The microphone may also be moved during recording.
The microphone winch system is particularly suitable in concert halls and larger music studios. In the meantime this system has been proven successful in many cases. The photo on the right shows a quadruple installation of the system in the large transmitting studio of the Frankfurt Broadcasting Station.
The great advantage of the system is quite obvious: The freedom of movement by the appearing artists is not hampered by any microphone cables or supports.

Range of Movement

The range of movement of the microphone starts approximately 1—2.50 meters below the concert hall ceiling and extends along the triangle shaped sidewalls which are 12 meters, and towards a triangle situated 2 meters above the floor, the side walls which are 2 meters shorter than the side-walls of the concert hall ceiling triangle. The maximum height difference between the two triangles is 15 meters.
The limits of the moving range can be adjusted by variable resistors in the remote control. The adjusted range of movement is automatically limited by terminal switches on the cable reels, on the one hand, and by cable-pull contacts at the ceiling guide openings, on the other hand. This arrangement eliminates an unintentional movement beyond the adjusted limits, and protects the whole system from being damaged or destroyed.

The Microphone Suspension

A ball is used for the suspension of the microphone at the point where the three suspension cables meet and form the tip of the pyramid. The cables are protected by a rubber coating. The microphone suspends from and is attached to an intermediate pipe which is mounted in the seat of the ball. A shock absorber in the ball seat prevents the microphone from oscillating. Any type of dynamic or condenser microphone in mono or stereo may be used. The weight of the microphone does not influence the operation of the system.

Cables

The following described cables which were especially developed for this system were used:

EMT 6209 — Condenser-microphone line, 6-conductors, shielded against RF, with steel core.

EMT 1919 — Suspension cable made of steel wire and a plastic coating.

The microphone cable is constructed in such a manner that no interference is caused by the cable during movement. Both types of cables are described in detail in the brochure „Audio Frequency-Cables".

Remote Control

The remote control of the whole system is actuated from the control room. A potentiometer with a scala is assigned to each winch unit, so as to preadjust the desired position of the microphone. After the lever switch is placed in the „operate" position, all three motors run to the preadjusted position and shut off automatically. The position „down", inoperative during normal operation of the system, may only be actuated if maintenance on the cable suspension is necessary.

Ceiling Guide Openings

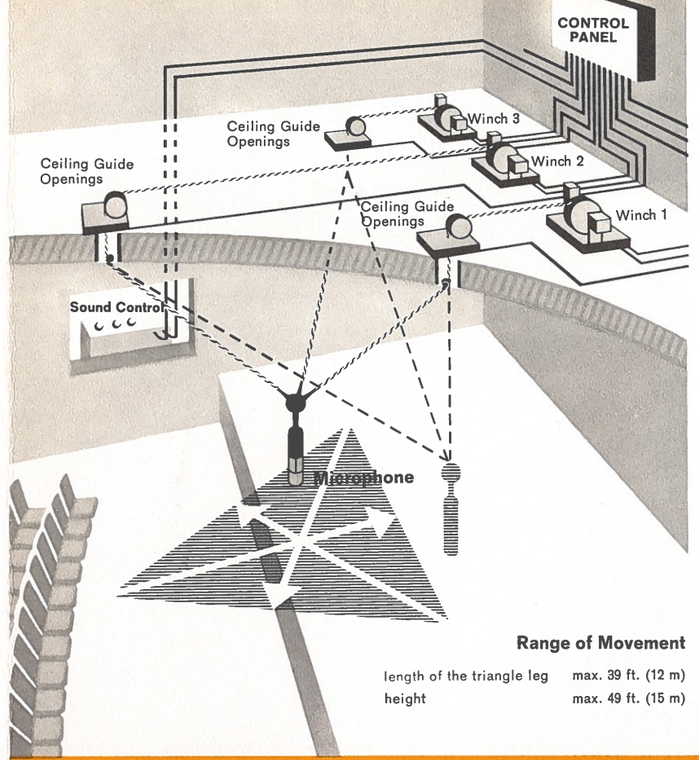
Three ceiling guide openings are provided for the system. These guides are steel pipes having a diameter of about 45 millimeters, and a lenght of 1.2 meters.
A cable guide roller on ball bearings is attached at the end of each guide. These steel pipes are introduced, from above, into a casing of about 60 millimeters diameters, so that the lower roll is positioned beneath the ceiling level. The casing is to be mounted into the ceiling construction. In order not to put any strees on the ceiling itself, the ceiling guides may be attached to the frame work of the roof support. A coat of paint like the paint on the ceiling renders the guide rollers almost invisible to the audience in the concert hall.

The Winch Units

The winch units are to be mounted in the attic above the concert hall. The cable reel is provided with guide notches which are engaged by the cable during the winding operation. The reels are driven by a three phase asynchromotor which has a gear of 7.5 revolution per minute. This results in a cable speed of about 12 cm/second. Normally, one of the three winch units is provided with special precious metal collector rings for the microphone circuit (6-poles and shield). The brushes are provided with multiple contacts, in accordance with the TUCHEL-system. In this way an interference free contact is assured during the turning motion of the reel. The position potentiometer and the two limit switches are coupled to the reel.

The Control Panel

The Contral panel for the whole system contains the polarized telegraph relay, the relay for the motor and the 60 volt power. Furthermore, operating elements are provided, in order to control the system from the control panel. It is essential that the control panel mount close to the winch units.



Range of Movement

length of the triangle leg	max. 39 ft. (12 m)
height	max. 49 ft. (15 m)

Models available

EMT 924 Microphone winch system (three dimensional) consisting of:

3 winch units, one of which is provided with a contact unit (collector rings)

3 guide openings for the ceiling

1 microphone ball with intermediate pipe, thread M 18 x 1.5 mm

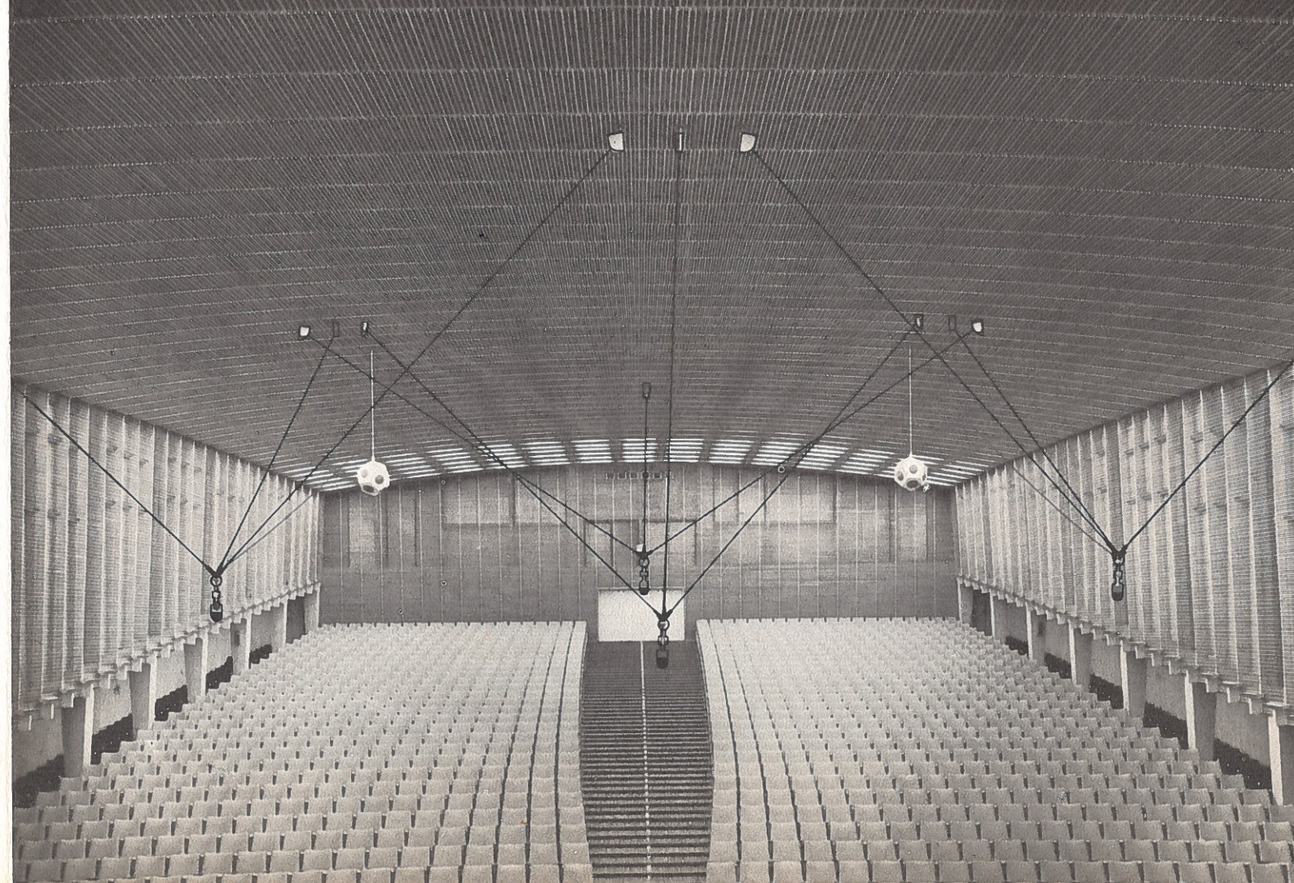
1 control panel with the necessary control elements

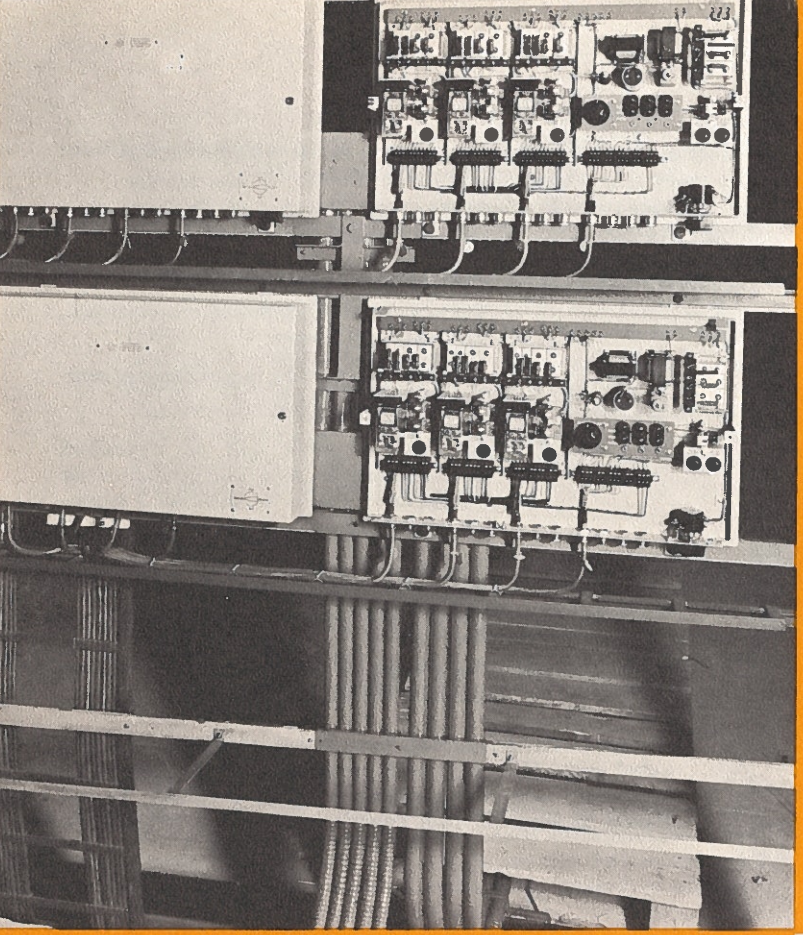
EMT 924/2 Microphone winch unit as described above, however with two contact units (collector rings) to be used for 2 microphone cables.

This type of unit is chosen, if two microphones of different characteristics or a stereo microphone is going to be used.

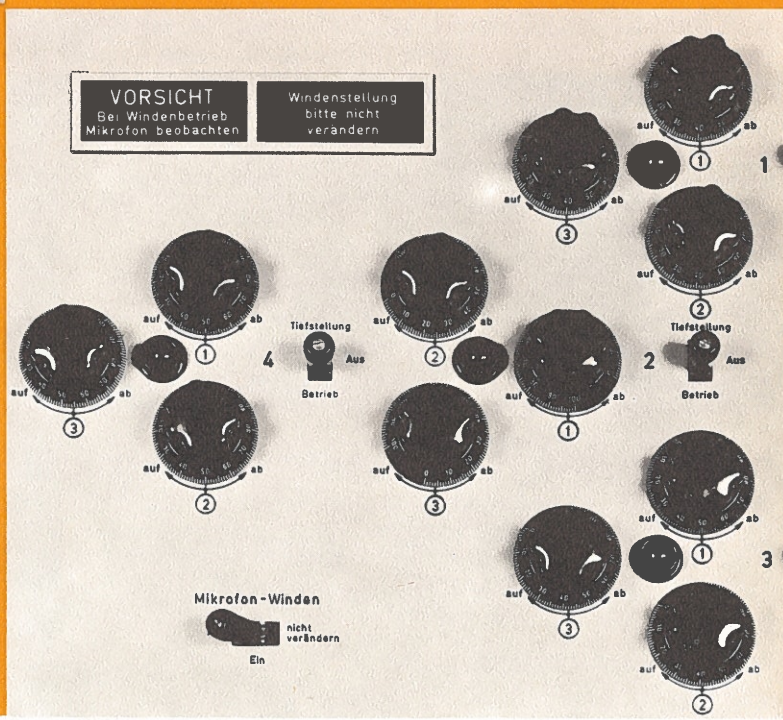
EMT 924 T Tandem piece for mounting of two microphones. Thread M 18 x 1.5 mm.

For special purposes, two dimensional systems can be provided under No: EMT 924 Z. In these the microphone may be moved only in a vertical plane. On request, we are always at your disposal concerning detailed information.





Panel boxes with the control relays and the motor relays



The remote control parts for a quadruple microphone winch system installed into a radio control room

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