



Elektroakustik

ELA M 251E / ELA M 251T

Condenser Microphones

TELE
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KEN

Product Manual

What's In The Box

M 950E Power Supply

Designed and built in America, the M 950E power supply features the traditional stylings of the original Austrian-made AKG 950E units partnered with the improvements of modern component technology and circuit board design. These units are built well over-spec to ensure reliability and safe operation for decades. Each power supply is calibrated to the specific microphone system it comes with. They are burned in as a full system to ensure optimum performance and stable operation.

The M 950E is fully regulated to ensure consistent operation regardless of line voltage variations or location. The heater voltage circuit is designed to ramp up to optimal voltage over 20 seconds, which helps to extend the life of the vacuum tube. The M 950E features premium Neutrik connectors. While these connectors are not historically accurate, they are considered a superior connector when compared to the original Cannon and 5-pin DIN connectors.

M 850E Cable

The M 850E features a historically accurate swivel stand mount connector on the microphone end and a premium Neutrik 7-pin XLR connector on the power supply end. It is designed to mate with original ELA M 250E and ELA M 251E microphones and utilizes the same wiring pin-out. This cable is made by TELEFUNKEN technicians in the USA using Sommer SC-Octave Tube cable, which has been custom-designed for the connection of tube microphones. Manufactured in Germany, SC-Octave Tube cable provides high quality, linear transmission with high flexibility and 100% interference rejection. 10 meters (32.8 feet) in length.

M 751 Rycote Shock Mount

The Rycote InVision USM is the best shock mount currently produced, both for functionality and isolation. Its unique, adjustable universal locking system can be quickly adjusted to securely fit a wide range of microphones. The USM utilizes specially designed clips made from robust Hytrel thermoplastic, designed to never sag or need rethreading. This indestructible, innovative design provides an additional 12 dB of isolation compared to conventional elastic shock mounts.

FC50 Locking Flight Case

TELEFUNKEN Elektroakustik's microphone flight cases are designed with delicate capsules, vacuum tubes, and electronic components in mind. The shell is constructed of layered hardwoods wrapped in a durable, vintage-inspired Cordura fabric. The inside of the case has cavities for each component covered with a plush suede for safe storage. Dual combination locks and nickel trim provide an understated, classic look. The embroidered TELEFUNKEN diamond logo on the inside lid and metal name plate complete the package.

WB50 Wooden Microphone Box

The microphone wooden boxes are custom-made in the USA of high quality solid white oak with a satin lacquer. The joint construction and materials cut no corners, featuring premium latch and hinge hardware and vintage-inspired internal fabrics, each carefully hand assembled. The outside of the box is finished with a TELEFUNKEN Diamond logo branded on the top face and metal name plate with the microphone model and serial number.

For a complete list of additional accessories and replacement parts for Diamond Series products, please visit <http://t-funk.com/shop>



Quick Start Guide

1. Thread the included shock mount or stand mount cable connector on to a sturdy microphone stand. Double check that the stand is stable and properly balanced; falls from microphone stands can require costly repairs. It is recommended to use the shock mount instead of the stand mount to reduce mechanical vibration from transferring to the audio path via the stand.
2. Set the microphone into the shock mount and tighten until hand tight.
3. Insert the cable into the base of the microphone and begin threading it on. If you experience resistance, reverse the threading direction and make sure the connector is inserted correctly.
4. Plug the other end of the microphone cable into the included power supply. It is recommended that the power supply be at least 3 meters from the microphone while recording. Make sure the cable is kept close to the stand and ground to avoid tripping or knocking over the microphone.
5. Make sure the power supply is set to the correct main voltage (115V or 230V). Plug the included power cable into the power supply, then into mains power.
6. Connect a standard 3-pin microphone cable (not included) to the power supply and then to your microphone preamplifier input.
7. Turn on the power supply. Let the system warm up for 10 minutes before use.

Safety Warning

Vacuum tube microphones, their associated power supplies, and their cables carry potentially harmful voltages. Make sure all connections are made before powering on your microphone system. Do not open your microphone or power supply while it's powered on. If for whatever reason your Diamond Series microphone stops working, turn it off and contact an authorized TELEFUNKEN repair center.

Handling

Handle your microphone, cable, and power supply with the utmost care. Remember that Diamond Series microphones are reverse engineered from vintage models, so most mechanical parts are custom machined and not cheaply or easily replaceable. If damage occurs or there is a change in operation, please contact TELEFUNKEN directly at repairs@t-funk.com.

Storage

When not in use, store your microphone in the included wooden box. It is not recommended to leave your microphone on a stand. Not only will dust degrade the response of the capsule over time, but this greatly increases the risk of a fall, which could result in required mechanical repair or cosmetic damage.

Properly coil your tube microphone cable when storing. Kinks left in the cable will expedite the deterioration of the conductors in the cable leading to shorts or opens in crucial contacts, and ultimately failure.

Cleaning

To clean fingerprints and light grime from your microphone, wipe with a soft cloth damp with an ammonia-based glass cleaner as soon as possible. We use microfiber cloths, but any soft, lint-free cloth will do. Spray the cleaner onto the cloth first. Never spray any liquid directly onto your microphone.

To lubricate your threaded cable collar, apply a small amount of electronics cleaner/lubricant (we use DeoxIT Gold) with a cotton swab. Do not spray the lubricant directly into the cable connector.

Never attempt to clean your microphone capsule. This should only be performed by a reputable, trusted professional. It is recommended to contact to TELEFUNKEN to have this service performed.

If you have any questions regarding cleaning your microphone or having these services performed by a TELEFUNKEN technician, please contact repairs@t-funk.com.

Diamond Series Overview

The Diamond Series features three primary microphone models that epitomize vintage vacuum tube microphone technology, which characterize and color the sounds of popular recorded music from the late 1940's through today. These three pillars of the vintage microphone world were selected to preserve their legacy not only because of their extremely high fidelity sonic abilities, but also because they exemplify the nearly gone culture of high quality manufacturing and hand-made workmanship.

The Diamond Series is currently comprised of five microphones; three main models and two variants. They are the C12, ELA M 251E, ELA M 251T, TELEFUNKEN U47 and TELEFUNKEN 48. All of the parts for these microphones were reverse engineered and recreated exactly to the originals in order to manufacture new models and provide restoration parts for the vintage versions. The large majority of the parts are custom tooled and machined in the USA.

Every microphone is hand-built and assembled from the ground up and tested in the TELEFUNKEN facility located in South Windsor, Connecticut. Each microphone is individually wired point-to-point; no circuit boards to be found here. Every plastic is riveted by hand, and each assembly is tapped and screwed together by hand. Diamond Series microphones are produced in smaller production runs to achieve the finest attention to detail.

The dream of TELEFUNKEN Elektroakustik remains to preserve these iconic microphones and their history, and to develop new microphone technology that draws inspiration from them. TELEFUNKEN continues the tradition of producing high fidelity recording instruments to benefit the recording and performing world, and to continue to characterize music for generations to come.

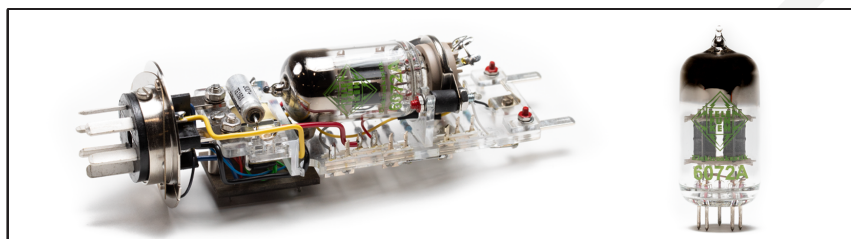


Vacuum Tube Information

TELEFUNKEN Elektroakustik Diamond Series microphones feature vacuum tubes specially selected to properly mate electronically and sonically with each model. All tubes used are burned-in and tested for noise and gain prior to installation in South Windsor, CT. TELEFUNKEN maintains a large stock of vacuum tubes and replacements that have been tested specifically for microphone use and are available directly.

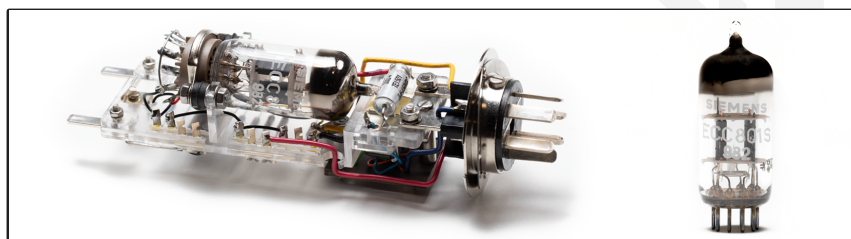
Please visit www.t-funk.com/shop/vacuum-tubes for more information.

TELEFUNKEN 6072A



This new production 6072A is a low-noise, sonically balanced, dual-triode vacuum tube recommended for use in vintage and new production ELA M 251E, C12, TF51 and similar microphones. Screened TELEFUNKEN Elektroakustik, this tube is included in new ELA M 251E microphone systems.

Siemens NOS ECC801S



This German-made new old stock vacuum tube is one of the most premium versions of the ECC801S dual-triode tube type ever made. Prized for its sweet tone and three-dimensional soundstage, this is considered an upgrade over 6072A and 12AT7 tubes. This tube is included in new ELA M 251T microphone systems.



ELA M 251 History

When Neumann ended their partnership with Telefunken in 1958 and began distributing the Neumann U47 under their own brand name, Telefunken contracted AKG to develop a new flagship condenser microphone. AKG's design was the ELA M 251, essentially a modification of their own flagship microphone, the C12. The ELA M 251 was made in four distinct versions: the 250, 251, 250E, and 251E. 250 versions featured two polar patterns, Omnidirectional and Cardioid, while 251 versions featured three polar patterns, with the additional pattern being Figure 8. 'E' versions used the 6072A vacuum tube and were the export version, as the AC701K vacuum tube found in non-'E' versions was not readily available outside of Germany. Just like the C12, all four 251 variants feature the legendary CK12 capsule and Haufe T14/1 output transformer. The C12 also uses the 6072A vacuum tube, as found in the 250E and 251E.

Though the 251 is based on the C12, there were many modifications made to the original design that account for the functional and sonic differences between the two models. A major upgrade found in the 251 is the self-biasing of the vacuum tube, compared to the fixed bias configuration found in the C12. With self-bias there is no calibration necessary when changing tubes and it is generally thought of as sounding more open and natural. It is a very common modification to convert AKG C12's to self-bias. Another upgrade is that the tube socket is inverted in the 251, making the high impedance line from capsule to tube grid significantly shorter, which reduces noise.

The 251 and C12 both feature the CK12, but the capsules are polarized very differently in the two models. In the C12, the front membrane is always grounded, and the back membrane varies from 0 to 120 volts, and in the 251, both the front and back membranes vary between -60 and +60 volts. Though the overall range is identical, the difference in approach does account for a discrepancy in how the capsule transfers sound energy into an electrical signal. The polarizing network itself was also moved inside the microphone in the 251, with the switch now found on the front of the microphone. It is speculated that this was done to imitate the look of the TELEFUNKEN U47. In comparison, the C12 is remote polarized and is adjusted by a switch found on the power supply or on another enclosure connected to the power supply.

The differences in body tube diameter, headgrille size and number of layers of mesh also all play a major role in the sonic differences between the two microphones. The C12 uses a single layer of mesh, whereas the 251 uses two layers of mesh. This significantly changes the resonance of the headgrille and in turn, the frequency response of the microphone.

Unlike the C12, the 251 was originally designed to be modular, with the intention that they could be field serviceable without the use of tools simply by swapping full subassemblies. If an amplifier, tube, or head assembly (capsule and switch housing) was to die, they could easily be changed without the use of a soldering iron or full understanding of the circuit. Unfortunately, over time this intention proved to be the weakest part of the design, as the original plastic housings that encapsulated the switch housing, circuit board contacts and amplifier as a whole are known to become very brittle and crack. TELEFUNKEN Elektroakustik began by molding and remaking these plastic pieces out of a superior material for vintage microphones that had literally crumbled over time.

It is estimated that roughly 2,000 251's were made between 1959 and 1963. Three other variants appeared in catalogs at the time of the release: the ELA M 260 Cardioid small diaphragm, the ELA M 261 Omnidirectional small diaphragm, and the ELA M 270, a stereo version of the ELA M 251E. While the 260 and 261 were released, the 270 did not make it past the prototype phase and only one original is known to exist in the world. The original ELA M 260/1 utilized the same AC701K-based circuit as the 250/1, whereas the new production ELA M 260 is based around the 5840W vacuum tube.

The new production TELEFUNKEN Elektroakustik ELA M 251E is nearly identical to original units, with all metalwork, plastics and hardware custom made to be reverse compatible with vintage units. Just as the original, a 6072A vacuum tube, Haufe T14/1 output transformer and CK12 capsule are utilized, which is built by hand in South Windsor, CT, USA. TELEFUNKEN Elektroakustik's CK12 is reverse engineered from one original example deemed one of the best ever made and is tensioned and tuned to the original early 60's production run of CK12's found in vintage 251's and C12's.

The ELA M 251T was developed through experiments involving sputtering the diaphragm material of a CK12 with alternative metals to see what difference, if any, it made. While the traditional CK12 capsule is sputtered with gold, the material settled on for the CK13 capsule is a mixture of titanium and aluminum named Alloy 2213. This material was developed in partnership with a local vendor who had supplied similar material to NASA for use in satellites. Due to the properties of this new material, the 251T provides a more modern sound when compared to the 251E, with greater accuracy in the low frequencies and an airy and delicate representation of the higher frequency range. Released in 2009, this modern take on the 251 is TELEFUNKEN Elektroakustik's most premium offering.

ELA M 251E



The ELA M 251E is a meticulously accurate recreation of one of the most legendary microphones of all time, featured on countless hits and classic recordings. By virtue of its smooth, yet present and open sonic character, the ELA M 251E large diaphragm tube microphone is a true classic with very few rivals. Ideal for vocals and acoustic instruments, the ELA M 251E offers an extended and focused low end, a detailed mid-range response and a silky top-end. Each microphone is 100% true in every detail to the original (the parts are interchangeable with the 50+ year old originals) and will deliver the same sonically opulent response that has made the ELA M 251E one of the world's most sought after recording tools.

CK12 Capsule

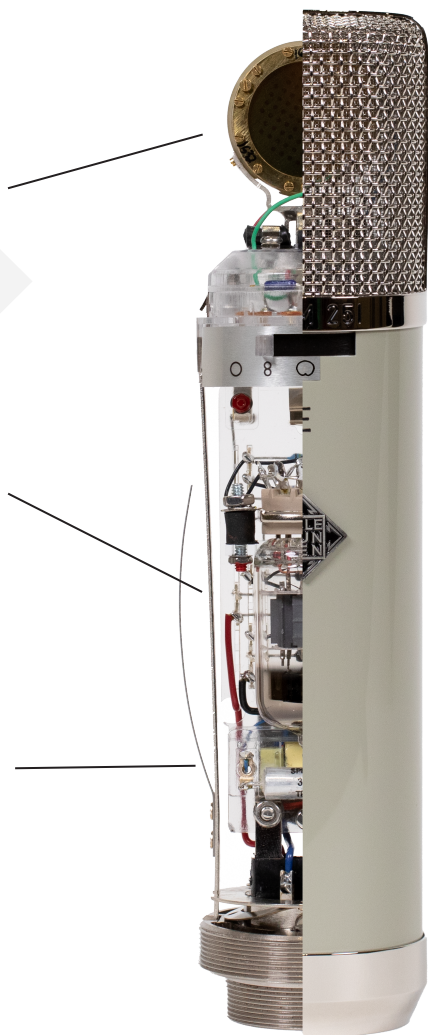
Our historically accurate replica CK12 capsule is made in limited quantity in the USA. This edge-terminated, dual diaphragm design is considered one of the truly best sounding capsules ever created.

6072A Vacuum Tube

This new production, TELEFUNKEN Elektroakustik-screened 6072A dual triode vacuum tube is electronically and sonically tested and burned-in in the USA. They are hand-selected for use in the 251E and provide stellar, vintage-correct performance.

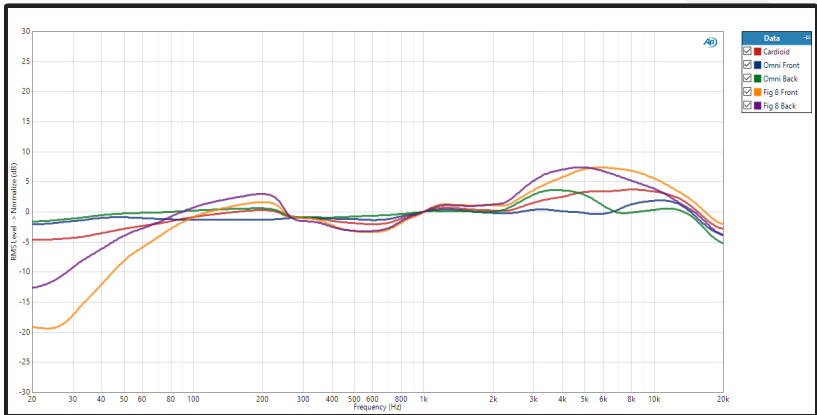
Haufe T14/1 Transformer

This output transformer is made to vintage specification by the original European manufacturer, Haufe, exclusively for us. The T14/1 provides a sonically pleasing tonality with excellent low frequency clarity.



Technical Specifications

Specification	ELA M 251E
Type	Vacuum Tube Condenser
Polar Pattern	Cardioid, Omnidirectional, Figure-8
Frequency Range	20 Hz - 20 kHz, ± 3 dB
Power Source	External Power Supply
Capsule	TELEFUNKEN CK12 – Edge Terminated Large Diaphragm
Tube	TELEFUNKEN 6072A
Transformer	Haufe T14/1
Sensitivity	17 mV/Pa ± 1 dB
THD at 1 kHz, 1 Pa (Amplifier)	< 0.2%
Output Impedance	200 Ω
Maximum SPL (for 1% THD)	130 dB
S/N Ratio	85 dBA
Self-Noise (Amplifier)	9 dBA
Dimensions	216 mm L x 50 mm Dia
Weight	596 g



ELA M 251T



Based on the classic ELA M 251E microphone, but with a modern twist: The ELA M 251T utilizes Alloy 2213™ as the diaphragm membrane material instead of gold. By employing Alloy 2213™, an amalgam of titanium and aluminum, the capsule provides greater accuracy in the low frequency range by attaining a higher damping factor to the motion of the membrane. Alloy 2213™ is lighter than gold, and when combined with the edge terminated CK12 capsule provides an airy and delicate representation of the upper frequencies. This affords the user a higher degree of detail in the recorded sound while still providing the depth of audio for which ELA M 251 microphones have been associated for decades.

CK13 Capsule

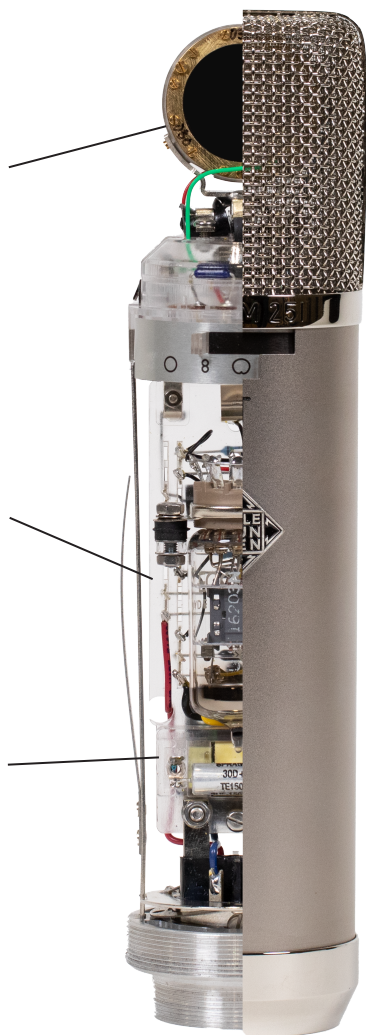
Our CK13 capsule is nearly identical to the CK12 except for the use of Alloy 2213 instead of gold as the membrane tensioning material. Alloy 2213 provides greater accuracy in the low end and a uniquely modern and airy upper frequency range.

NOS ECC801S Vacuum Tube

The new old stock Siemens ECC801S is considered one of the best sounding dual triode vacuum tubes ever manufactured. This increasingly rare tube is considered a premium upgrade in the 251 circuit. Made in Germany.

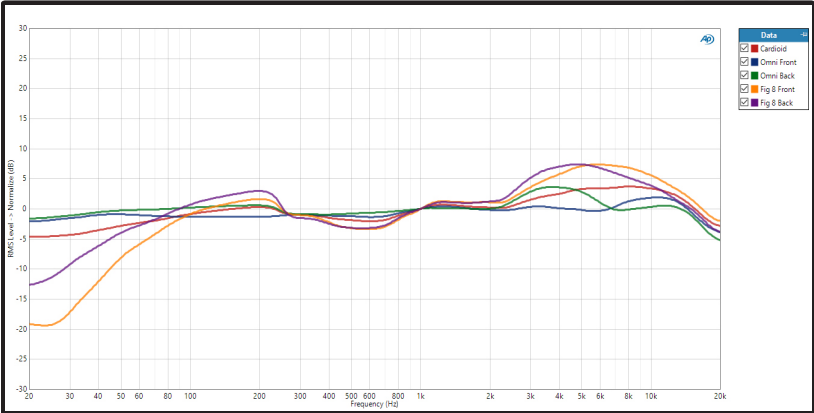
Haufe T14/1 Transformer

This historically accurate output transformer is made by the original European manufacturer and is used in our 251E, 251T, and C12. It provides excellent performance in the 251 circuit and is a great match to the NOS ECC801S.



Technical Specifications

Specification	ELA M 251T
Type	Vacuum Tube Condenser
Polar Pattern	Cardioid, Omnidirectional, Figure-8
Frequency Range	20 Hz - 20 kHz, ± 3 dB
Power Source	External Power Supply
Capsule	TELEFUNKEN CK13 – Edge Terminated Large Diaphragm
Tube	Siemens ECC801S NOS
Transformer	Haufe T14/1
Sensitivity	17 mV/Pa ± 1 dB
THD at 1 kHz, 1 Pa (Amplifier)	< 0.2%
Output Impedance	200 Ω
Maximum SPL (for 1% THD)	130 dB
S/N Ratio	85 dBA
Self-Noise (Amplifier)	9 dBA
Dimensions	216 mm L x 50 mm Dia
Weight	596 g



System Configurations

System	ELA M 251E	ELA M 251T	ELA M 251E Stereo	ELA M 251T Stereo
M 950E Power Supply	X	X		
M 950ES Power Supply			X	X
M 850E Cable	X		2X	
M 850T Cable		X		2X
WB50 Wooden Box	X	X	2X	2X
M 751 Shock Mount	X	X	2X	2X
FC50 Flight Case	X	X		
FC50S Flight Case			X	X

Stereo Sets

Every TELEFUNKEN Elektroakustik tube microphone Stereo Set includes two meticulously matched microphones and a dual power supply in a premium flight case. The American-made power supply is capable of powering both microphones at one time and the included carrying case easily holds both sets of microphones, cables, and accessories. All critical components, including the capsules, tubes and transformers, are hand-selected and tested for matched gain and frequency response. These sets offer the user the knowledge and comfort that the tools they are using will give identical responses for the most critical stereo recording.



Warranty

TELEFUNKEN Elektroakustik warrants that any capsules and tubes used in their microphones are free from defects in material and workmanship for the period of ninety (90) days from the original date of purchase, and agree to replace any capsule or tube which, under normal installation and use, disclose such defect. This is provided that the complete microphone is delivered to TELEFUNKEN Elektroakustik intact for examination and provided that such examination discloses, in the judgment of TELEFUNKEN Elektroakustik, that the tube or capsule is indeed defective. Upon replacement, TELEFUNKEN Elektroakustik will provide an additional 90-day limited warranty on the new capsule or tube.

This warranty does not extend to any capsule or tube which appears to have been misused, altered, neglected, damaged, or stored in any manner that adversely affects it, or used in violation of instructions furnished by us. This limited warranty shall be void and of no further force or effect whatsoever if the microphone is repaired or modified by any person other than an authorized representative of TELEFUNKEN Elektroakustik. This warranty shall not apply to any defect, failure, or damage caused in whole or in part from attempts by personnel other than TELEFUNKEN Elektroakustik's to open, repair, or service the microphone; nor to damage to a unit which has been modified by persons other than TELEFUNKEN Elektroakustik personnel.

Please visit www.t-funk.com/warranty to register your microphone.



Warranty Registration

CE RoHS

In compliance with the following requirements:
EMC Directive: 2014/30/EU (EN 55013 applied)
Low Voltage Directive: 2014/35/EU (EN 60065 applied)
RoHS2 Directive: 2011/65/EU

Repairs & Service

Repairs on new TELEFUNKEN Elektroakustik microphones are covered under a limited warranty plan and repair costs will be determined based upon the date of purchase and the date in which the warranty was registered. Repairs & Service covered under the warranty plan are done at no charge for labor, parts and service.

Please visit www.t-funk.com/repairs for microphone repair information.



Microphone Repair Form

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