



Elektroakustik

TELEFUNKEN

U47 / U48

Condenser Microphones

TELE
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Product Manual

What's In The Box

M 940H Power Supply

Designed and built in America, the M 940H Power Supply features traditional, vintage-correct styling, partnered with the improvements of modern component technology and circuit board design. These units are built well over-specification to ensure reliable, 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 940H is fully regulated to ensure consistent operation regardless of line voltage variations or location. The M 940H features a traditional Tuchel cable connector and vintage correct pinout. It is designed to mate with vintage TELEFUNKEN U47 and U48 Tuchel cable connectors without modification and will properly power VF14, VF14M, or VF14K vacuum tube-based amplifiers.

M 840TH Cable

The M 840TH features traditional Tuchel connectors and is designed to mate with original TELEFUNKEN U47 and U48 microphones and NG power supplies. This cable is made by TELEFUNKEN technicians in the USA using Sommer SC-Quad cable. The OFC (oxygen-free copper) conductors provide excellent transmission with high flexibility. Superior interference rejection is provided by 100% shielding with dense helical copper mesh screen plus additional metalized fleece foil. 10 meters (32.8 feet) in length.

M 740 Shock Mount

Vintage-styled clasping elastic shock mount with durable metal cages designed to fit all TELEFUNKEN U47 and U48 microphones.

FC40 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.

WB40 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 on to a sturdy microphone stand. Double check that the stand is stable and properly balanced; falls from microphone stands can require costly repairs.
2. Set the microphone into the shock mount and fasten the latches.
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 mains voltage for your region (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 TELEFUNKEN U47 and U48, C12, ELA M 251E, ELA M 251T. 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.

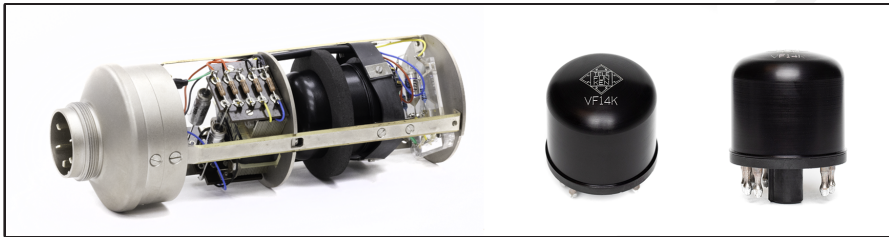


Vacuum Tube Information

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 VF14K



Manufactured to be a direct “plug and play” retrofit for an original VF14M tube with no modifications to circuit, cable or power supply required. The TELEFUNKEN VF14K is employed in the TELEFUNKEN Elektroakustik TELEFUNKEN U47 and U48 microphones.

After considerable research, TELEFUNKEN Elektroakustik located a glass tube, of obscure origin, originally manufactured for use in transoceanic telephone transmission. This is not a Nuvistor tube, nor an EF86, both of which have been previously used as substitutes for original VF14’s. This tube captures all of the “magic” of the original tube, with the resulting sonic characteristics being extremely close to the original VF14, with nearly identical gain and distortion measurements.

The TELEFUNKEN VF14K has a 5-year manufacture’s warranty with TELEFUNKEN Elektroakustik.



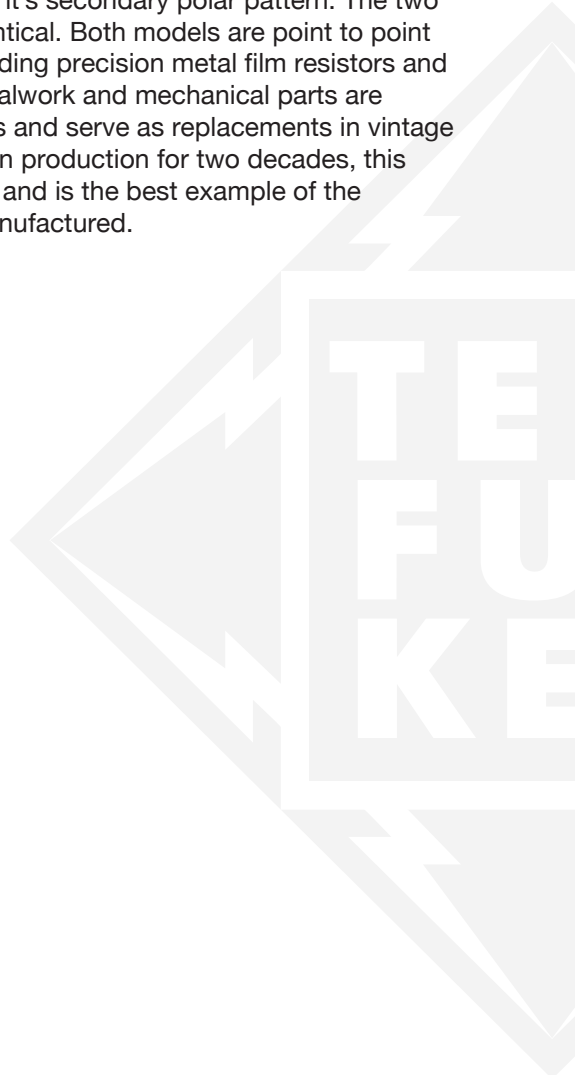
TELEFUNKEN U47 History

In production since 2004, the TELEFUNKEN Elektroakustik recreation of the TELEFUNKEN U47 was developed fresh off the success of the re-release of the ELA M 251. As with the 251, this microphone was designed to be as true to the original design as possible. The TELEFUNKEN U47 utilizes significant cosmetic elements of the earliest iterations of the original “long body” design, including a nickel plated headgrille and classic TELEFUNKEN Diamond badge, as well as the use of vintage-correct Tuchel connectors and “NG” style power supply.

Electronically, the TELEFUNKEN U47 features a Mylar M7 capsule, the original circuit with VF14K vacuum tube, and a BV8 transformer, as this combination has been determined to provide the absolute best version of the classic mid-forward frequency response associated with the TELEFUNKEN U47. Originally M7 capsules were tensioned with PVC, which is now known to crack and fail over time. With longevity in mind, the non-historic change from PVC to Mylar was an easy decision to make. Mylar is the industry standard tensioning material and can be found in most other highly regarded capsule designs including the K47, K67, and CK12. While TELEFUNKEN Elektroakustik M7 capsules have always been made in North America, as of 2022 they are now made in South Windsor, Connecticut by the same small team that makes the CK12 capsule, which is found in the ELA M 251E and C12.

The major obstacle to releasing a microphone based on this classic design is related to the tube selection. With virtually no VF14/VF14M's available for purchase and no exact replacement tube types known to exist, most settle on modifying the circuit to accept different tubes; usually tubes that look like VF14s but do not operate the same. TELEFUNKEN developed the VF14K to solve this problem for new customers and old purists alike. The VF14K consists of a NOS military grade glass vacuum tube and a passive circuit housed in an enclosure designed to fit the original VF14 tube socket. As there is no circuit modification necessary, this is the best solution both for those with vintage microphone models that need new tubes and those purchasing new TELEFUNKEN U47 or U48 microphones with the intention of installing a NOS VF14. The TELEFUNKEN U47 operates on a single 105-volt line, same as the original design.

Soon after the TELEFUNKEN U47, the TELEFUNKEN U48 was also released. With its defining red polar pattern logo, the TELEFUNKEN U48 features Figure-8 instead of Omnidirectional as it's secondary polar pattern. The two microphone models are otherwise identical. Both models are point to point wired with premium components including precision metal film resistors and polystyrene capacitors. Almost all metalwork and mechanical parts are interchangeable with original examples and serve as replacements in vintage restoration projects and repairs. Now in production for two decades, this design has been honed and perfected and is the best example of the TELEFUNKEN U47 currently being manufactured.



TELEFUNKEN U47



The TELEFUNKEN U47's authoritative mid-range and extended low frequency response have made it the gold standard for microphones in professional recording studios around the world. The TELEFUNKEN U47 excels at capturing everything from vocals, drums, and electric guitar to orchestral and chamber recordings with its uniquely recognizable voicing. Our recreation is built true to the original design; with point-to-point wiring of the exact circuit with near-identical metalwork, contacts, cable connectors, and circuit components. It is an exceptional version that delivers the famous high-fidelity tone and character that is synonymous with its name.

M7 Capsule

Our M7 center-terminated, dual diaphragm capsule mixes the mechanical design of the earliest German condensers with the later, more stable tensioning material, Mylar. The result is a very punchy response with depth and clarity. Made in limited quantity in South Windsor, CT.

VF14K Vacuum Tube

Our direct drop-in replacement for the extremely rare VF14/VF14M vacuum tube consists of a NOS glass tube and a passive circuit housed in a plug-and-play casing. It provides excellent tone and low noise operation without needing to modify the original circuit or tube socket.

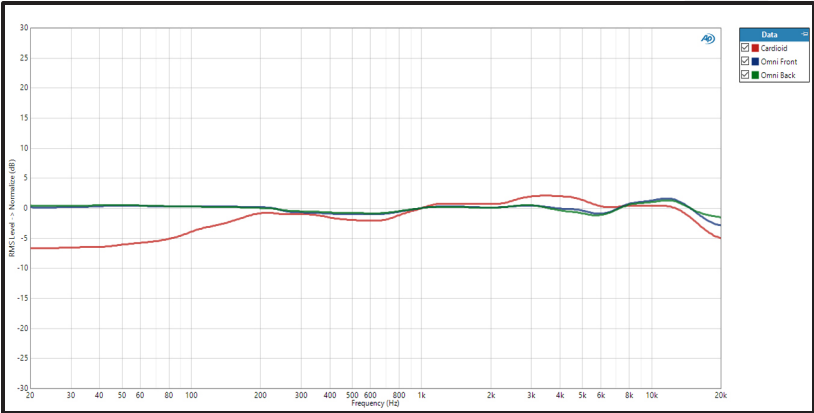
BV8 Transformer

This hefty, nickel alloy core transformer is wound in America to vintage specification. It perfectly matches the VF14K-based amplifier and delivers a full and wide frequency response with a brilliant tonality and very low distortion.



Technical Specifications

Specification	TELEFUNKEN U47
Type	Vacuum Tube Condenser
Polar Pattern	Cardioid, Omnidirectional
Frequency Range	20 Hz - 20 kHz, ± 3 dB
Power Source	External Power Supply
Capsule	TELEFUNKEN M7 – Center Terminated Large Diaphragm
Tube	TELEFUNKEN VF14K
Transformer	TELEFUNKEN BV8
Sensitivity	24.5 mV/Pa, ± 1 dB
THD at 1 kHz, 1 Pa (Amplifier)	< 0.3%
Output Impedance	200 Ω
Maximum SPL (for 1% THD)	127 dB
S/N Ratio	85 dBA
Self-Noise (Amplifier)	9 dBA
Dimensions	240 mm L x 60 mm Dia
Weight	620 g



TELEFUNKEN U48



The TELEFUNKEN U48 is a historically accurate variant of the TELEFUNKEN U47 that features Bidirectional (or Figure-8) instead of Omnidirectional as its secondary polar pattern. It is distinguished from the TELEFUNKEN U47 by its red polar pattern switch. The Bidirectional capability can be very helpful in controlling ambient and non-direct sound when recording ensembles or in less-than-ideal recording environments. In Cardioid operation, the TELEFUNKEN U47 and U48 are sonically identical and provide the same remarkable tone, perfect for everything from vocals and piano to double bass and percussion. Just like the TELEFUNKEN U47, the TELEFUNKEN U48 is built by hand in small batches true to the original design.

M7 Capsule

Our M7 center-terminated, dual diaphragm capsule allows for Cardioid and Figure-8 operation in the TELEFUNKEN U48. These capsules provide a rich, clear tone and are made by hand in South Windsor, CT.

VF14K Vacuum Tube

The VF14K is our solution to the dwindling supply of NOS VF14/VF14M vacuum tubes originally found in this microphone design. The VF14K consists of a NOS glass tube and basic passive circuitry housed in a plug-and-play casing. It provides correct sonic and electronic operation with no circuit, power supply, or tube socket modification.

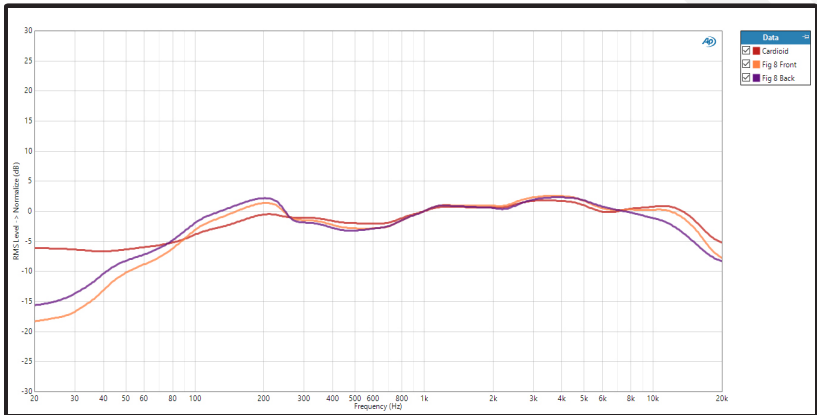
BV8 Transformer

This twin coil design output transformer is almost identical physically and electronically to the original specification. It provides a 6.5:1 ratio with low distortion and a very wide and flat frequency response.



Technical Specifications

Specification	TELEFUNKEN U48
Type	Vacuum Tube Condenser
Polar Pattern	Cardioid, Figure-8
Frequency Range	20 Hz - 20 kHz, ± 3 dB
Power Source	External Power Supply
Capsule	TELEFUNKEN M7 – Center Terminated Large Diaphragm
Tube	TELEFUNKEN VF14K
Transformer	TELEFUNKEN BV8
Sensitivity	24.5 mV/Pa, ± 1 dB
THD at 1 kHz, 1 Pa (Amplifier)	< 0.3%
Output Impedance	200 Ω
Maximum SPL (for 1% THD)	127 dB
S/N Ratio	85 dBA
Self-Noise (Amplifier)	9 dBA
Dimensions	240 mm L x 60 mm Dia
Weight	620 g



System Configurations

System	TELEFUNKEN U47	TELEFUNKEN U48	TELEFUNKEN U47 Stereo	TELEFUNKEN U48 Stereo
M 940H Power Supply	X	X		
M 940HS Power Supply			X	X
M 840TH Cable	X	X	2X	2X
WB40 Wooden Box	X	X	2X	2X
M 740 Shock Mount	X	X	2X	2X
FC40 Flight Case	X	X		
FC40S 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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