UT Twin48

TWIN MODE TUBE-DRIVEN LARGE DIAPHRAGM CONDENSER MICROPHONE

Owner's Manual

THANK YOU!

Thank you for purchasing the United Studio Technologies UT Twin48. We realize how many microphones are out there, and we are honored that you have given us a chance. We have done all that we can to exceed your expectations of quality in terms of craftsmanship, feel, appearance, and most importantly, sound. This tube microphone should perform reliably under most any conditions, and last for more than a lifetime. We don't make our products to just be good for the price, but to simply be the best we can make them. We have scrutinized and labored over not just the major parts like the transformer, capsule, and selected vacuum tube; but in every component from end to end, as well as the circuit design and mechanicals. We used the highest quality gold contact switches and connectors we could obtain, the best cable brand we could find, and used some of the highest quality audiophile grade (PRP) resistors available, made specifically for United, as well as custom made JB film capacitors and other polystyrene and tantalum capacitors made specifically for United. With proper care, our products should last a lifetime of use and beyond.

CHAD KELLY

United Studio Technologies, LLC.

Baton Rouge, Louisiana USA

PRODUCT SERVICE

REGISTER YOUR PRODUCT

Before we begin, please take the time to visit **www.unitedstudiotech.com** to register your product. To ensure you receive proper and uninterrupted warranty support for your product, please register your unit within 14 days from purchase.

UPDATES TO THIS MANUAL

Occasionally, we may have updates to this manual. All current manuals can be downloaded at **www.unitedstudiotech.com**. For your convenience, every page of this manual displays the version number at the bottom of the page.

SAFETY

Warning: To reduce the risk of electric shock, do not open the device as there are no user-servicable parts inside. **Refer servicing to qualified personnel!**

1. Read and keep these instructions; heed all warnings, and follow all instructions.
2. Do not expose this device to rain and moisture.
3. Clean only with a dry cloth.
4. Servicing is required when the device has been damaged in any way.
5. Always connect the output with a standard 3 pin XLR (male XLR to female XLR) cable that is in good working order. Always connect the microphone with the supplied 7 pin XLR cable only. No other 7 pin cable is guaranteed to be compatible with our design.
6. Always fully connect the microphone to the power supply before powering on the device..
7. Do not engage +48v phantom power on your microphone preamp. It is unnecessary.
8. Ensure the voltage selector is set appropriate for your territory, and connect with the supplied IEC power cable.
9. Do not connect this microphone power supply to an ungrounded AC power source (2 prong AC outlet or power cable). Earth grounding is a requirement.
10. This microphone ships with a silica gel packet. Do not discard it; this ensures that moisture/humidity does not accumulate on the mic capsule diaphragm and that no part of the device begins to oxidize. If the silica package becomes lost or discolored, replace it with a new, good quality silica gel packet.

WARRANTY SERVICE

United warranties this product to be free from defect in materials and workmanship for one year from date of purchase, for the original purchaser to whom this equipment is registered. This warranty is non-transferrable.

This warranty is void in the event of damage incurred from unauthorized service to this unit, or from electrical or mechanical modification to this unit. This warranty does not cover damage resulting from abuse, accidental damage, misuse, improper electrical conditions such as mis-wiring, incorrect voltage or frequency, unstable power, disconnection from earth ground (for products requiring a 3 pin, grounded power cable), or from exposure to hostile environmental conditions such as moisture, humidity, smoke, fire, sand and other debris, and extreme temperatures.

United will, at it's sole discretion, repair or replace this product in a timely manner. This limited warranty extends only to products determined to be defective and does not cover incidental costs such as equipment rental, loss of revenue, etc. Please visit us at **www.unitedstudiotech.com** for more information on your warranty, or to request warranty service.

This warranty applies to products sold in the United States of America. For warranty information in any other country, please refer to your local distributor for United Studio Technologies. This warranty provides specific legal rights, which may vary from state to state. Depending on the state in which you live, you may have rights in addition to those covered in this statement. Please refer to your state laws or see your local retailer for more information.

NON-WARRANTY SERVICE

If you have a defective unit that is outside of our warranty period or conditions; we are still here for you and can get your unit working again for a modest service fee. Please visit us at **www.unitedstudiotech.com** to contact us about setting up a repair or for more information.

With the proper care, your United gear should last a lifetime and provide a lifetime of enjoyment. We believe the best advertisement we can have is a properly working unit being put to great use. Let's work together to make it happen.

CHAPTER 1: LET'S GET STARTED!

1.1 HARDWARE CONTROLS (POWER SUPPLY)

FRONT PANEL:

Power Switch - Engages power on the power supply. Ensure that the UT Twin48 is connected before powering up. Make sure you disengage power on the unit before unplugging the microphone as well.

Mode/Pattern Switch - Selects the polar pattern of your choice.

RF Filter Switch - Engages the RF (Radio Frequency) Filter. The RF filter should be engaged when used in radio broadcasting, or when radio interference is an issue. The effect is not generally audible but can help to clean up RF interference and other electromagnetic noise or interference in the line.

Power Switch - Turns power on or off.

Pilot Lamp - Indicates power status.

REAR PANEL:

AC Inlet - Connect your power cable here. The AC Inlet accepts standard IEC320 C14 cables.

Voltage Selector - This switch selects operating voltage for your location. **Always ensure this is in the correct position before engaging power!**

Microphone Input - Use the included, proprietary 7 pin XLR connection to attach the UT Twin48 microphone.

Output XLR - Balanced, microphone-level XLR output. Connect this to your microphone preamp.

1.2 CONNECTIONS

The UT Twin48 must always be used with it's included power supply.

1. Connect the UT Twin48 microphone to the power supply by using the included 7-pin cable.
2. Ensure the voltage select switch is set to the appropriate setting for your territory.
3. Connect the IEC power cable to the AC inlet, then plug it into your power source.
4. Connect your XLR cable to the XLR Output on the power supply, then plug it into the mic input of your audio equipment.
5. Engage power using the Power Switch on the power supply.

Note: 48V phantom power is not required.

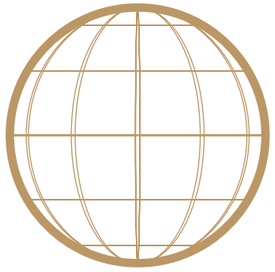
Fig. 1: The front panel of the UT Twin48 Power Supply; this contains all controls.

Fig. 2: The rear panel of the UT Twin48 Power Supply; this contains all I/O.

1.3 **PATTERN SELECTION**

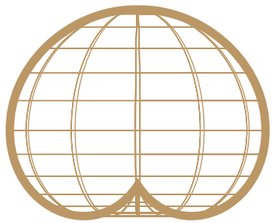
The UT Twin48's two operating modes go beyond just polar pattern selection.

The classic 47 and 48-style mics each derived their cardioid operation in very different ways — producing subtle tonal differences as well as a slightly different polar pattern. For the first time ever, the UT Twin48 delivers both options in a single microphone.



47 MODE

- **47 Cardioid**: de-couples the rear diaphragm in a process known as True Cardioid, for a louder sound with improved sensitivity with more background and top-end detail.
- **47 Omni**: The omnidirectional pattern from the classic 47 design. Good for room mics and other applications.



48 MODE

- **48 Cardioid**: polarizes the rear diaphragm with the same voltage as the backplate — AKA Active Cardioid — for a more tightly closed-in, warmer, intimate tone that is a bit lower in sensitivity.
- **48 Figure-of-8**: the figure 8 pattern from the classic 48 design, capturing front and rear while rejecting the sides - great for duets and Blumlein Technique.

Many recording engineers prefer the warmer, more intimate sound of the 48 Cardioid, while others prefer the bigger, open sound of the 47 Cardioid — these options make the UT Twin48 a perfect choice for many different applications; Experiment to find the most flattering capture of a singer's voice; add a bit of ambience to a horn performance; and get the cleanest, most articulate tones imaginable from strings and horns — all from a single mic!

1.4 **MITIGATING "REAL WORLD" PROBLEMS**

While your UT Twin48 should provide clean, trouble-free operation in just about any given situation; we'd like to take a moment to go over some real-world problems we've encountered in our combined years of experience, and how best to navigate through them.

NOISE, INTERFERENCE, AND RADIO

Though rare, we've encountered this issue with other microphones in the past. Usually the result of operating near a radio broadcast station or other large antennae. Sometimes this is exacerbated by the use of large snakes and in-wall wiring that share a common shield. Though sometimes these situations cannot be 100% resolved; they can usually be reduced down to an acceptable level by reducing the amount of exposure the signal path has to the source of interference. This means using the shortest length of microphone cable possible, avoiding the use of audio snakes or in-wall connections; especially if unsure of the length or quality of that wiring. Sometimes re-positioning a mic or cable can be of great benefit. Snake cables (both in-wall and free-standing) with a shared foil shield are the worst of all in this situation; as the foil shields on individual channels can branch out to act as an antenna to pick up signals from the air. Not all microphone cables are created equal; and if there were ever a case for a very well constructed microphone cable with really low noise and good CMR (common mode rejection), this is one. It's also crucial to ensure the mic cable has a proper and dense enough shield, with 100% shield coverage, and is terminated properly to pin 1 on both ends. While we don't recommend specific brands here, some general advice is that a braid shield will have small gaps in the shield due to the braid geometry which, though usually OK, in high-RFI (radio frequency interference) environments, are not ideal. A thick woven shield is better, and a shield that is coupled with a layer of foil or conductive plastic is better yet; ensuring total shield protection. Double-shielded microphone cable is the best option in high-RFI environments.

The onboard RF filter applies an RF low-pass filter to the balanced microphone output, which can resolve RF interference in some situations where RF is contaminating the microphone lines. The switch should not have an audible effect when RF is not present, but can sometimes be a great problem solver.

BUZZ, HUM, AND GROUND LOOPS

Though rare, microphones (like all electronics) can misbehave when not properly grounded. Like most phantom-powered condenser microphones, the UT Twin48's XLR pin 1 grounds the microphone chassis and circuit. This pin mates to the pin 1 XLR input of your preamp, console, or recording interface, and from there to the earth ground on the IEC power connector for that device. Things become tricky if this device itself does not have a 3-pin standard IEC power cable, but

instead uses a 2-pin wall-wart supply. In some cases, you may have a small interface which has no power supply, relying on bus power from a computer's USB, FireWire, or Thunderbolt connector. This situation is sometimes referred to as vicarious grounding, where a ground connection is passed through several devices through various analog and digital cables before finally connecting to the house grounding. Computers, unfortunately, can be a source of significant EMI (electro-magnetic interference). While these situations cannot always be fully remedied — especially with field recording — at least being aware of these potential issues when setting up and selecting equipment can spare you from the worst of these effects.

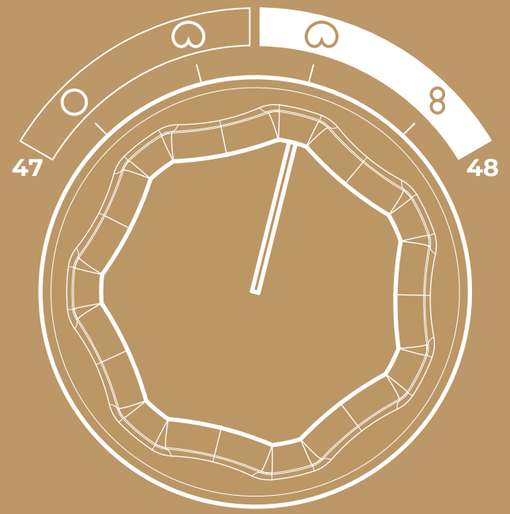
For instance, if your interface, laptop, preamp, etc. all have no earth ground, which is entirely possible with laptop recording; you may intentionally select a device to connect in the chain that the microphone can ground to. An example of this would be connecting an outboard preamp or other processor to the interface, so long as it has a 3 pin IEC power cable that is plugged in and an audio connection such as XLR or TRS that can connect to the interface. This will ground the interface, even if the piece of outboard gear is not being used in the signal chain. Additionally, well constructed and shielded digital cables, particularly with robust ferrite rings clamped on one or both ends, can help reduce any noise contamination from a digital device into the microphone. In any case, for safety and good operation, it cannot be recommended that the UT Twin48 be operated in a situation where there is no access to earth ground to ground the microphone's pin 1 connector.

WHEN TO USE A POP FILTER?

It is generally good advice to use a pop filter any time you are recording a vocalist. You should always get the best pop filter you can, one that is as sonically neutral as possible. Once you have found the proper distance for spacing a vocalist from the microphone; the pop filter can be set in place to properly maintain that spacing.

CHAPTER 2: ABOUT THE UT TWIN48

2.1 DEVELOPING THE UT TWIN48



Developing

a manufacturable version of the legendary 47/48 circuit has been a personal obsession for the better part of a decade. To do so using only parts that are currently available has added difficulty to this challenge, because so much of the ‘47’s sound is intrinsically tied to the quirky behavior and characteristics of some of these vintage components. Many years ago we began to evaluate many currently manufactured high-end capacitors in an attempt to find something available which would approximate the sonic profile of the beloved wax and paper-in-oil capacitors of yesteryear. We started evaluating currently manufactured and available NOS tubes in order to find something that was the closest available ‘next-of-kin’ to the unobtainable steel tubes of a bygone era. After many years of trials, we did find most of the parts we needed that met our requirements and settled on a robust tube with a known history of use as a service replacement part in restoring vintage ‘47 and ‘48 microphones. Service and support is of paramount importance to us, after all, it was vital that we design the UT Twin48 in a way that allows us to continue making them AND supporting them for the foreseeable future.

After building microphone replicas privately for a number of years, I became aware of a number of people who would request the ‘48’ circuit, not because they needed the figure-of-8 pattern; but merely because they preferred the sound. After some investigation, I began to understand why there is a slight sonic difference. The ‘47 and ‘48 circuits deal with the rear diaphragm in different ways, and as a result of this as well as the additional components inline, the ‘48 circuit has a slightly reduced polarization voltage and sensitivity in cardioid mode, resulting in a slightly more muted and closed in (some would say warmer, more intimate) sound. After hearing them side by side, it became apparent to me that both modes had their uses and that it would be quite something to represent both of these modes of operation in a single device.

The journey to releasing the UT Twin48 has been a long one, with many twists, turns, and setbacks; but we fully believe this has been worth the wait and we could not be more pleased with the final result. We believe the UT Twin48 represents the absolute best-in-class option for a ‘47 style microphone, bar none.

The UT Twin48, featured with its power supply and briefcase.

CHAPTER 3: WAXING PHILOSOPHICAL

3.1 ROOM ACOUSTICS

Probably no factor in recording is as important as room acoustics. No matter how good a microphone and other equipment may be, recording in an untreated room is usually a recipe for disappointment. Drums will sound brash and cheap, vocals hollow and cavernous. Reflections from untreated and parallel walls of ordinary homes and commercial spaces create a comb filtering effect that can wreak havoc on audio fidelity, and almost never work in favor of the recordist. Fortunately, these issues can be remedied sufficiently on a home budget and do not require booking time in a professional studio.

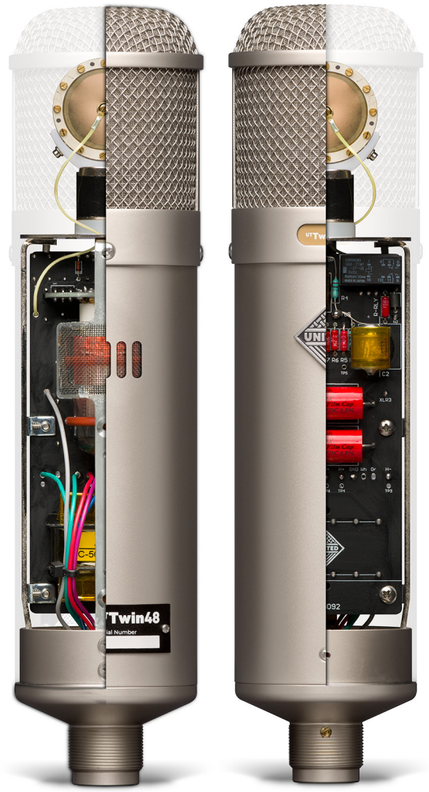
The first solution is to treat the room. There are a number of affordable acoustic panel and foam solutions on the market which do a satisfactory job. It is not necessary to over-treat a room; but the needs of every room are different. It is worth taking the time to research, understand the problems of your room, and decide how lively or deadened you want your room to be. Typically, it is more than sufficient to treat a room with just the minimum needed to make the room sonically neutral. If you can do this, then you will have a room that is acceptable for tracking, editing, and mixing.

The second solution is more localized. If you only plan to record vocals, perhaps you don't need to treat the room. Any of various brands of vocal shields or portable vocal baffles will sufficiently decouple the microphone from its rear wall reflections and deliver an amazing improvement to the sounds you are able to capture. This one investment can often make the difference between a recording that sounds professional and one that does not; regardless of the quality of microphone, preamp, or interface. The importance of taking a bit of time to isolate the mic from its room reflections cannot be overstated.

3.2 MICROPHONE CHOICES AS AN ARTIST'S PALETTE

One of the joys for those who get to sometimes work or record in a big studio is the great microphone selection that professional facilities often have available. These impressive collections are usually amassed over a long period of time, and often include fine specimens of tube, solid state, transformer-coupled, transformerless, large diaphragm, medium diaphragm, and small diaphragm condensers, as well as dynamic and ribbon microphones. They will usually have both vintage specimens as well as new designs.

For all the expense and grandeur, what this truly boils down to is merely a studio's ability to pick the right microphone for the right application; pulling from a palette of options that range from very dark to very bright, with many many shades in between. Microphones with different pickup configurations and amounts of off-axis rejection, and microphones with unique textures that may complement a given situation, such as smoothness or warmth. Every voice has a slightly different sibilance range, and sometimes one can find a mic whose presence peak does not emphasize those sibilant frequencies. Some microphones are better for male vocals, some for female. As a general rule, professional producers and engineers tend to pair a microphone to an artist that brings out qualities lacking in the source, or de-emphasizes qualities the source has too much of. For instance, a brighter and thinner voice benefits from a darker microphone which has more girth and body. A deep, powerful voice can call for the opposite kind of selection to help bring out top end and articulation. A microphone with some degree of neutrality usually guarantees that it will work on the widest possible range of situations with good results. These are not hard and fast rules, but generally hold true.

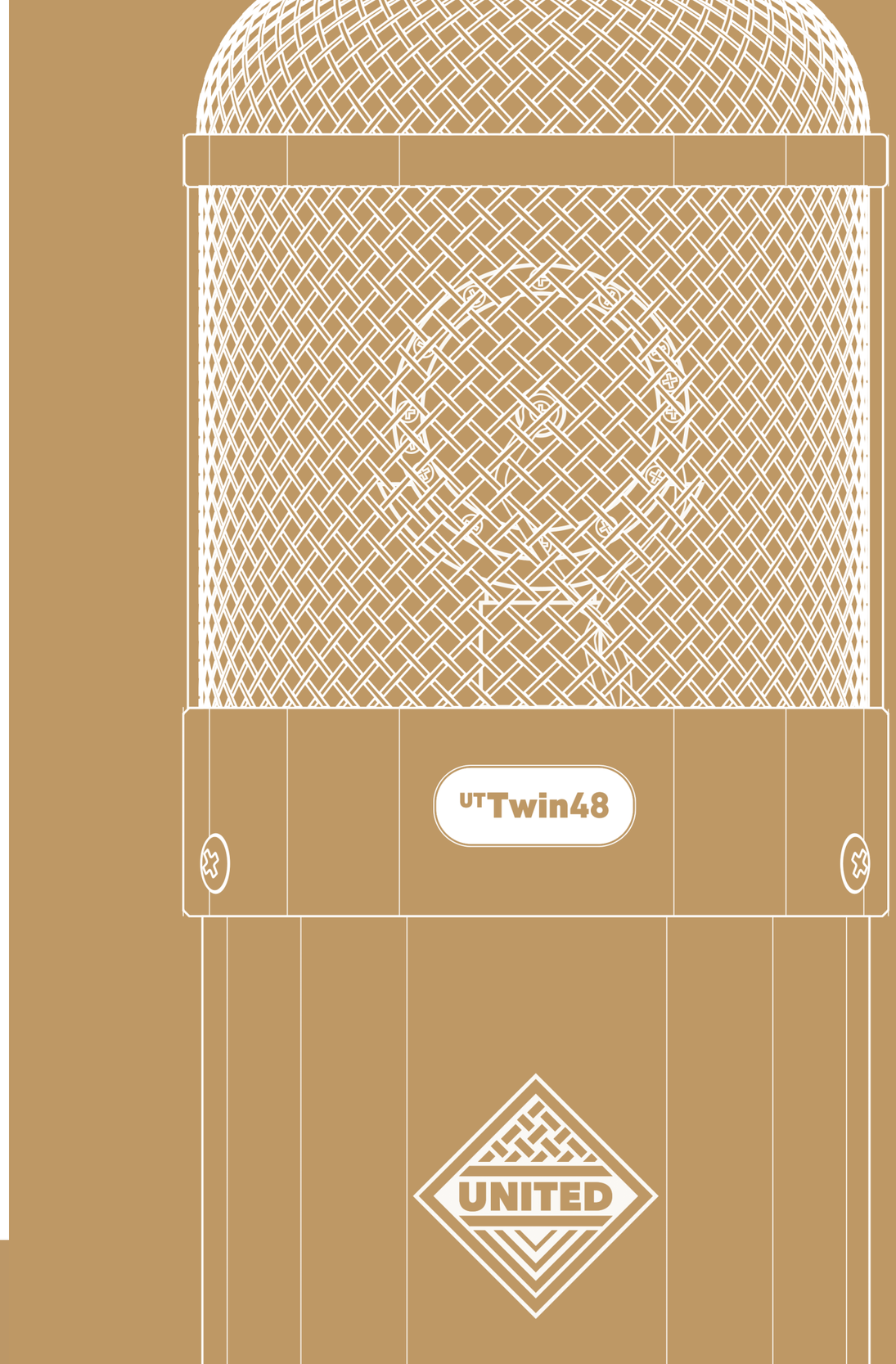


Any great mic locker begins with one mic, and the UT Twin48 is an excellent first choice as well as a welcome addition to a more established studio's collection. With its big, fairly neutral sound and slightly forward midrange presence; the UT Twin48 is the perfect studio 'workhorse' microphone to use in a variety of ways throughout a session.

CHAPTER 4: TECHNICAL SPECIFICATIONS

Type	Condenser Microphone
Diaphragm	6 micron, 24k gold sputtered Mylar (PET film)
Capsule	UT Series, 34 mm brass, single backplate K48
Frequency response	20 Hz - 20 kHz
SPL	137dB @ 0.5% THD
Polar Pattern	47 Cardioid, 48 Cardioid, 47 Omni, 48 Figure-of-8
Output Impedance	35 Ω
Output Connector	24k gold plated 3 pin XLR, pin 2 HOT, pin 1 GND
Amplifier Type	Vacuum tube
Tube	NOS selected EF86 pentode vacuum tube
Self noise	11 dBA
Output	Custom-wound UT Series transformer, made in USA
Body	Nickel electroplated, solid milled brass
Mount	Suspension type shock mount (included)
Interconnect	Custom Sommer 7 conductor XLR cable 6 m / 19.7’
Power Connector	IEC320 3-conductor receptacle
Power Input	110-120 vAC or 220-240 vAC; switch selectable
Dimensions - Microphone	Height: 26.5 cm / 10" Diameter: 6.25 cm / 2.5" Shockmount Depth: 16 cm / 6"
Dimensions - Power Supply	Height: 9.25 cm / 3.25" Width: 19.5 cm / 7.5" Depth: 18 cm / 7"
Dimensions - Briefcase	Height: 17 cm / 6.75” Width: 50 cm / 19.75" Depth: 32 cm / 12.75"

As a commitment to constant improvement, United reserves the right to change any specifications, at any time, without notification.



OUR STORY IS YOUR STORY.

Every musician and audio engineer has to start somewhere. We start with the entry-level gear we can afford, and work our way up to using the best of the best gear.

In today's age, we all have the luxury of simulating all of the best classic gear directly in a DAW — but is a simulation as good as the real thing? Sure, we think plenty of it is great, but it never settles our need for the original gear. With the rise of software-variants of classic gear, quite a few companies have taken to selling the "original" as a hardware recreation — but very sadly, many of us have seen we're not being sold the real thing by these companies. And to top it all off, the best classic gear is getting older, less reliable, and more expensive — even finding truly great technicians to work on them has gotten to be very difficult.

We at United are working hard to make sure everyone can finally access gear built like the original classics, with zero compromise. We have put everything we have into our products — from conception, custom parts, New Old Stock parts, and in many cases final assembly and testing that is done by hand in Baton Rouge, Louisiana.

United UT FET47 Prototype Phase 3 #1. This is where we started to take shape, and define our future.

CAVE DAUGHDRILL
Vice President / Co-Founder /
Pinball Fanatic

CHAD KELLY
President / Co-Founder /
Barista / Music Director

www.unitedstudiotech.com

Welcome to the United family!

Don’t forget to register your product
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