



StudioProjects®

C SERIES MICROPHONES



Studio Projects is manufactured and marketed under the direction of

PMI AUDIO GROUP

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- Professional Studio Microphones
- Ultimate professional build quality
- Pressure-gradient transducer
- Transformerless circuitry
- Large diameter pressure gradient capsule employing 6 um gold sputtered Mylar diaphragms
- Ultra low-noise FET Preamplifier
- Dual Triode "6072" hand tested tubes (T3 Only)
- Multi-Pattern variable power supply (T3 Only)
- Heavy duty road case (All Models)
- Elastic heavy duty shock mount (All Models)
- Quality German "WIMA" components

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Studio Projects® Instruction Manual

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WHAT IS STUDIO PROJECTS?

There are many condenser microphone brands on today's market. Studio Projects offers a better microphone at a competitive price to meet a specific need. Primarily, the Studio Projects line was created to provide exceptional engineering and performance at a fraction of the cost of most high quality German microphones. By utilizing the best manufacturing techniques of today along with quality components, Studio Projects microphones compete both in build, design and sonic performance with those famous German brands. The proof is in the listening.

Our company is partnered with Beijing 797 Audio Co., Ltd, a company that has been building microphones since 1956. The result of this partnership is an award-winning, innovative and dependable series of microphones which stand out in today's market.

The microphones themselves are the evolution of many combined years of experience in the music business as well as the manufacturing sector. Studio Projects is proud to continue to bring quality products to market and we sincerely hope you enjoy our works.

DESCRIPTION / CARE

Although the Mylar diaphragm of the capsule is more robust than the PVC diaphragms of the original German designs from the 1930s, it is extremely fine and liable to damage if mishandled. There are two primary factors that must be remembered when handling these microphones:

- 1) Keep the microphone dry.
- 2) Avoid any shock to the microphone such as would be caused by dropping, etc.

All electronic equipment should be kept dry, but it is even more important to avoid any damp conditions when using condenser microphones, as this can cause partial short circuits in the capsule itself. The result can be crackling noises and low output. Care should also be taken to avoid using the microphone in the open air without substantial wind protection.

ELECTRICAL FEATURES

The C1, C3, LSD-2, and C4 use FET circuits to convert the extremely high capsule impedance to a low impedance signal. The output is class-A, balanced and transformerless. All C-Series microphones are designed to ensure good common mode rejection, and protection from RF interference, both of which can degrade the audio signal.

The C Series microphone, when compared to other makes and models, has very low noise and is capable of handling sound pressure levels up to 148dB without distortion.

OPERATION

Since the C Series microphone can handle high sound volume levels, it can be used safely near musical instrument amplifiers, kick drums, etc. If the source sound is very loud, however, this may overload the microphone amplifier, or the mixer/preamplifier which the microphone is plugged in to. If this occurs, simply engage the -10dB pad (if applicable), adjust the sound level, or reposition the microphone.

The C1, C3 and T3, are addressed from the side marked by the Studio Projects logo. The large diaphragm capsule inside the head grille has a smooth frequency response; therefore the acoustic information translates smoothly and completely. The microphone maintains a wide response when reproducing all transient material of music and speech whether used in an ensemble setting, or in a voice-over studio. The microphones are well suited to tasks such as voice recordings, strings, overheads, broadcast, and production use. **Experimentation is key** for optimum performance and microphone placement is crucial to a proper recording.

The C4's are best employed for spot miking instruments such as guitar, piano and wind instruments. They are also very good for ambience miking and Drum Overheads.

The LSD2 is primarily useful for single point stereo recording of ensemble performances, drum miking, X-Y and mid-side techniques.

PROBLEMS

Should any microphone become damp and fail to operate properly (start crackling, or go very quiet), simply place it in a warm and very dry environment for 24 hours. The ideal environment is an airing cupboard. Studio Projects microphones are of robust build, but are delicate instruments by nature. If the microphone fails to work after being dropped, it should be returned in adequate packing to the supplier. Manufacturing faults are nearly non-existent but should any fault occur, the microphone will be repaired (or replaced) free of charge.

CONNECTING UP

With the mixer volume down, using a high quality balanced and shielded XLR cable connect the microphone to the preamplifier input and switch on the 48V phantom power. **-IMPORTANT NOTE-** The C1, C3, C4 and LSD2 will not operate unless 48V phantom power is on. The microphone should be powered up for about a minute until the polarizing voltage on the capsule has fully stabilized. Some background noise is possible during the first few seconds after switch-on. Keep the gain controls on the microphone amplifier or mixer well down as the output from the microphone is high.

For the T3, use the supplied 7-pin XLR cable to connect the microphone to its power supply (PST3). Use a balanced and shielded XLR cable to connect from power supply to mic preamplifier. For the LSD-2, use the supplied Y-cable for stereo operation.

USING STUDIO PROJECTS MICROPHONES

Studio Projects solid-state microphones employ high quality externally polarized pressure gradient transducers with FET impedance converters driving balanced, class-A output circuits. The vacuum tube model T3 is a transformer balanced class-A circuit designed around the 12AY7 (6072) vacuum tube.

The 27mm capacitor element is based on the classic Braunmuhl Weber 'center electrode' design which provides a smooth extended frequency response with a slight bump in response generally in the 5 kHz to 12 kHz region. The capacitor membrane is 6um Mylar with a vapor-deposited coating of gold over a proprietary bonding agent.

All models are supplied with an elastic shock mount system and although the microphones are not particularly susceptible to sounds transmitted through the case, it is advisable to use this shock mount wherever possible. The C1, C3, T3, and LSD-2 are more sensitive to sounds from the front than from the rear and sides when used in the cardioid pattern. The front of the microphone is indicated by the Studio Projects logo. To get the best quality, be sure the sound source is in line with the front of the microphone. **-IMPORTANT NOTE-** For up close vocals, a 'nylon' pop shield is recommended to avoid moisture damage to the transducer. Vocalists should sing across the front of the microphone at a distance of 6" to 24".

The C3, T3, and LSD-2 are Multi-Pattern microphones which provide cardioid, omni directional, and figure of eight patterns. This allows the microphone to be utilized in a variety of recording conditions: The cardioid pattern is directional and used to attenuate sound transients occurring on the sides and to the rear of the microphone. The omni directional pattern picks up sounds uniformly from all directions, although it becomes more directional at higher frequencies. The Figure of 8 pattern rejects sounds from the sides (left/right) while equal but 180° out of phase signals are picked up from the front and rear of the microphone. These patterns will provide the user with a variety of approaches to a given recording application. The T3 is additionally capable of hypercardioid - which is quite directional and especially useful in attenuating sound from the sides and sub-cardioid - which offers some of the depth and presence of the omni, while maintaining directionality as that of a cardioid.

ORIGINS AND MANUFACTURE

Studio Projects Microphones are manufactured in Beijing, China by 797 Audio to a specification defined by Studio Projects, Torrance, California. All Studio Projects microphones are inspected and tested at the factory, then inspected and tested again at PMI Audio Groups facility prior to shipping. Studio Projects microphones meet the requirements of electronic equipment sold both in the USA, Canada, and the European Union.

APPLICATIONS

- Close miking of instruments with high sound pressure levels
- Announcer's mic for broadcasting/dubbing
- Home recording and project studios
- Vocalist recording
- Spot mic for: wind instruments, strings, percussion and guitar amps.
- XY - Coincident Cardioids
- Mid-Side Method
- Stereosonic Technique (Blumlein)
- Overheads

C1

The C1 is a high quality true condenser pressure gradient microphone with a FET impedance converter. The polar pattern is fixed cardioid. The C1 uses a transformerless circuit which features low noise and wide dynamic range. The polar response is very linear with a slight rise in frequency response between the 5 kHz to 12kHz range. Signals coming from the side and rear are attenuated with very little phase coloration. The C1 also features a three position switch on the rear which alternately enables a -10dB pad, and a 150Hz high-pass filter.

The microphone is supplied with a shock mount, windscreens and heavy duty road case with locking latches.

The capacitor element is manufactured to the classic Braunmuhl Weber 'center electrode' design which provides smooth extended frequency response. The diaphragm material is 6 um Mylar with a vapor deposited gold coating.

C1 SPECIFICATIONS

Type:	Single diaphragm pressure gradient condenser microphone cardioid.
Polar pattern:	cardioid.
Frequency response:	30Hz~20000Hz.
Sensitivity:	14mV/Pa=-37dB (0dB=1V/Pa).
Output impedance:	<200 Ohm.
Load impedance:	>1000 Ohm.
Max. SPL:	131 dB SPL for 1% THD @1000Hz (0dB SPL=0.00002Pa).
Noise:	(Line): 27 dB (A weighted) ---17 dB.
S/N ratio:	77 dB.
Power requirement:	48 +/- 4V.
Current consumption:	<2.5mA.
Circuit:	transformerless output circuit, featuring low self noise and large dynamic range.
Connector:	Gold-plated 3-pin XLR
Pad:	-10 dB
Low cut:	6 dB/Octave at 150 Hz.
Diameter:	2.1" length: 8.9"
Weight:	26.9oz



C3

The C3 is a high quality externally polarized pressure gradient microphone with a low-noise, discrete, FET impedance converter driving a balanced class-A output stage. It has three selectable polar patterns, cardioid, omni, and figure of eight. Like the C1, the C3 has a 3-position switch which alternately enables a -10dB pad, a high pass filter at 150Hz, or none of the above. The C3 employs a 1.06" (27mm) 6 um capsule for natural reproduction of sound. The hallmark features of this combination are that of low noise and wide dynamic range.

The C3 is supplied with a shock mount, windscreen and heavy duty road case with locking latches.

C3 SPECIFICATIONS

Type:	1 inch large dual diaphragm FET condenser microphone.
Polar pattern:	cardioid/omni directional/figure of 8.
Frequency response:	30Hz~20000Hz.
Sensitivity:	12mV/Pa=-38dB (0dB=1V/Pa).
Output impedance:	<200 Ohm.
Load impedance:	>1000 Ohm.
Max. SPL:	132/142dB SPL for 1% THD @1000Hz (0 dB/-10 dB pad, 0 dB SPL=0.00002Pa).
Noise:	(Line) ---28 dB (A weighted)---18 dB.
S/N ratio:	76 dB.
Power requirement:	48 +/- 4V.
Current consumption:	<2.5mA.
Circuit:	transformerless circuit, featuring extremely low self noise and large dynamic range.
Connector:	Gold-plated 3-pin XLR.
Pad:	10 dB
Low cut:	6 dB/Octave at 150 Hz.
Diameter:	2.1" length: 8.9"
Weight:	26.9oz



T3

The T3 is a high quality pressure gradient condenser microphone with a circuit designed around a selected 12AY7 (6072) dual triode with a transformer balanced output. The capsule is a 1.06" (27mm) Braunmuhl Weber based, center terminated, dual membrane design. Power to the microphone is derived from a proprietary power supply (PS3). It is from the power supply that the polar patterns of the mic are controlled. Available patterns are omni directional, wide cardioid, cardioid, hypercardioid and figure of 8. The T3's response is quite linear with a slight rise in frequency response around 5kHz to 12 kHz. Signals originating from the side and rear of the mic are reproduced accurately and with little phase coloration.

The T3 vacuum tube microphone is supplied with a shock mount, variable pattern power supply, dedicated 7pin XLR cable, windscreen and heavy duty road case with locking latches.

T3 SPECIFICATIONS

Type:	Large dual diaphragm vacuum tube microphone.
Polar pattern:	cardioid/ omni directional /figure 8
Frequency response:	20Hz~20000Hz.
Sensitivity:	14mV/Pa=-37 dB (0dB=1V/Pa).
Output impedance:	<250 Ohm.
Load impedance:	>1000 Ohm.
Max. SPL:	125dB SPL for 1% THD @1000Hz (0 dB SPL=0.00002Pa).
Noise:	(Line) ---28 dB (A weighted)---18 dB-A.
S/N ratio:	76 dB.
Power requirement:	Supplied Power Supply (SPT3) 110/220
Current:	200V DC high voltage, <1.5mA
Filament:	6.3V DC, <370mA.
Connector:	Gold-plated 7-pin XLR
Diameter:	2.1" length: 8.9"
Weight:	26.9oz



C4

The C4 is small diaphragm condenser microphone featuring interchangeable capsules, switchable -10dB pad/high pass filter and a linear low-noise, solid state amplifier body. The microphone's modularity makes it a useful multi-purpose tool intended for all-around use on stage, on location and in studios of all caliber.

As a cardioid (pressure gradient) microphone, the C4 provides excellent pickup of on-axis sources while attenuating extraneous sound occurring from around and behind the mic. This makes it ideal for close miking of individual instruments where bleed from other nearby instruments or sound is undesirable. The C4 cardioids also make excellent stereo pairs for coincident and near-coincident miking techniques such as X-Y and ORTF. Additionally the C4's are quite useful on a drum kit as overheads and on toms.

Used as an omni-directional (pressure) microphone, the C4 offers a warm tonal response and is recommended especially for close miking in favorable acoustical environments. There is very little off axis coloration owing to the inherent physical properties of pressure capsules, and it is this - combined with the low self-noise of the mic amplifier that makes the C4 omni an excellent ambience mic—especially in pairs. In a good room, a pair of omni's can provide a vibrant and live feel to recordings, which is not achievable through the use of directional microphones.

Recommended uses are, spaced pair omni, Jecklin disc (OSS), piano, guitar, drum overheads and room miking. The C4 is available in pairs with shockmounts, windscreens and case.

C4 SPECIFICATIONS

Type:	Single diaphragm modular FET condenser microphone
Polar pattern:	cardioid (CC1) Omni-directional (OC1)
Frequency response:	40Hz~20kHz.
Sensitivity:	12m V/Pa. where 1 Pa = 94dB SPL
Output impedance:	<200 Ohm.
Load impedance:	>1200 Ohm.
Max SPL:	150 dB SPL with -10dB pad
Equivalent Noise:	16 DB SPL, (A-weighted per IEC268-15).
S/N ratio:	78 dB
Power requirement:	P48 +/- 4V
Current consumption:	<2 ma
Circuit:	FET driven, discrete balanced output
Connector:	Gold-plated 3-pin XLR .
Pad:	-10 dB
Low cut:	6 dB/Octave at 250 Hz.
Length:	4.90"(124.5mm)
dia:	.787" (20mm)
Weight:	3.3oz. (92g)



LSD2

The LSD-2 is comprised of two separate dual-membrane solid state microphones contained within a single housing. Its capsules are mounted in close proximity on a vertical axis - the upper capsule assembly having the ability to rotate 270 degrees horizontally, relative to the lower capsule. Two C&K three-way switches control the polar response, high pass filtering and -10dB pad for each capsule (The switches on the front of the body correspond to the lower fixed capsule, while the switches 180° opposite on the back of the mic control the rotating upper capsule). It is the combination of capsule articulation and independent pattern switching which allows a user of the LSD2 to achieve all manner of coincident pair stereophonic recording techniques. Due to the close proximity of the capsules, there is no phase cancellation resulting from time delay between the two signals. This translates into excellent mono compatibility.

The inner workings of the LSD-2 are essentially that of two Studio Projects Model C3 microphones. The capsules are 1.06" (27mm) diameter, dual membrane, Braunmuhl-Weber design. These are independently coupled through low-noise amplifiers based on FET driven discrete balanced output stages. The outer housing is plated brass with a single layer brass wire mesh grill surrounding the capsules.

Included with the LSD-2 microphone is a dedicated 7-pin XLR to dual 3-pin XLR "Y" cable, magnum-sized foam windscreen, standard shockmount and carrying case.

LSD2 SPECIFICATIONS

Type:	Stereo condenser microphone with vertically coincident 1.06" (27mm.) dual diaphragms.
Polar pattern:	Cardioid, Omni directional Figure of 8
Frequency response:	30~20000Hz.
Sensitivity:	12mV/Pa=-38dB(0dB=1V/Pa).
Output impedance:	<200 Ohm.
Load impedance:	>1200 Ohm.
Max. SPL:	139/146dB SPL for 1% THD @1000Hz(0dB/-10dB pad, 0dB SPL=0.00002Pa).
Noise:	(Line)---28 dB (A weighted)---18 dB-A.
S/N ratio:	76 dB.
Power requirement:	24v.-52.5v. phantom power
Current Consumption:	2.5mA
Connector:	Gold-plated 7-pin XLR
Size:	2.1" (53.34mm.) dia.
Weight:	1.8 lbs.



STUDIO PROJECTS LIMITED WARRANTY

THIS PRODUCT IS FOR PROFESSIONAL USE ONLY

PMI Audio Group warrants that all products will be free from defects in material or workmanship:

A: For a period of (3) years from the date of purchase (hereinafter the labor warranty period), PMI Audio Group will repair or replace this Product if determined to be defective. After the expiration of the labor warranty period, the Purchaser must pay labor charges.

B: In addition, PMI Audio Group will supply, at no charge, replacements for defective parts for a period of (3) years from the date of purchase. During the labor warranty period, to repair the Product, Purchaser must return the defective Product, freight prepaid, or deliver it to PMI Audio Group Service Center. The product to be repaired is to be returned in either its original carton or a similar package affording an equal degree of protection. PMI Audio Group will return the repaired Product freight prepaid to the Purchaser. PMI Audio Group is not obligated to provide Purchaser with a substitute unit during the warranty period or at any time. PMI Audio does not Warranty consumables like tubes that wear from normal use.

CONDITIONS

1. Notification of claims: Warranty Service: If Purchaser discovers that the Product has proven defective in material or workmanship, then written notice with an explanation of the claim shall be given promptly by Purchaser to PMI but all claims for warranty service must be made within the warranty period. If after investigation PMI determines that the reported problem was not covered by the warranty, Purchaser shall pay PMI for the cost of investigating the problem at its then prevailing time-and-materials rate. No repair or replacement by Purchaser of any Product or part thereof shall extend the warranty period as to the entire Product. The specific warranty on the repaired part only shall be in effect for a period of ninety (90) days following the repair or replacement of that part or the remaining period of the Product warranty, whichever is greater.

2. Exclusive Remedy: Acceptance: Purchaser's exclusive remedy and PMI's sole obligation is to supply (or pay for) all labor necessary to repair any product found to be defective within the warranty period and to supply, at no extra charge, new or rebuilt replacements for defective parts. If repair or replacement fails to remedy the defect, then and only in such an event, shall PMI exchange to Purchaser a new or reconditioned unit. Purchaser's failure to make a claim as provided in paragraph 1 above or continued use of the product shall constitute an unqualified acceptance of such Product and a waiver by Purchaser of all claims thereto.

3. Exceptions to Limited warranty: PMI shall have no liability or obligation to Purchaser with respect to any Product subjected to abuse, improper use, negligence, accident, modification, failure of the end-user to follow the operating and maintenance procedures outlined in the users manual, attempted repair by non-qualified personnel, operation of the unit outside of the published environmental and electrical parameters, or if such products original identification (trademark, serial number) markings have been defaced, altered, or removed. PMI excludes from warranty coverage, Products sold AS IS and/or WITH ALL FAULTS and excludes used products which have not been sold by PMI to the Purchaser. PMI also excludes from warranty coverage consumables such as fuses and batteries, etc.

4. Proof of purchase: The dealer's dated bill of sale must be retained as evidence of the date of purchase and to establish warranty eligibility.

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NOTES



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