

**525A
POWER
SUPPLY**



**OPERATING
INSTRUCTIONS**

SPECIFICATIONS

Frequency Response: See curve.

Discrimination: See curve. **Output**

Level with various loads:

Unbalanced-High impedance (10,000 ohms
or higher)

—35 db re 1 v, 10 dynes/cm² (voltage) 600
ohms, —54 dbm re 10 dynes/cm² 150 ohms, —58
dbm re 10 dynes/cm² 30 ohms, —64 dbm re 10
dynes/cm² Balanced—(Using 4665 plug-in
transformer)

600, 150 or 30 ohms, -53 dbm re 10 dynes/cm²

Operating Temperature: —20° to +140° F

Physical:

525A Power Supply, width 8⁵/₈" , height 2³/₈" , depth 7¹/₂" .

Power Requirements: 117 v, 50/60 cycles, 15 watts

Finish—29B microphone, stainless steel; 175A base—
gray anodize; 525A Power Supply—silver gray cover
with gray anodized panel.

Mounting—166A holder attachment or 169A Shock
Mount, both threaded ⁵/₈"—27 to mate with 22C Floor
Stand, 26A or 24C desk stand or other standard
microphone stand.

Weight-M30 System (unpacked)-6 lbs. 11 oz.

ACCESSORIES

4665 Plug-in Transformer for balanced output line.

167A Extension Cable 25 ft. long equipped with Cannon
RWK 6-22C and RWK 6-21C connectors.

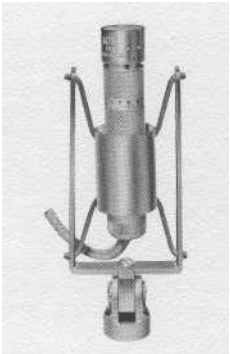
170B Wind Screen clamps between microphone and
base; OD 1⁵/₁₆" , 2¹/₄" long.

22C floor stand, adjustable 35" to 64".

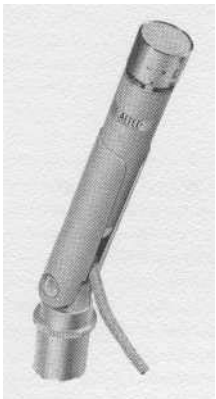
24C or 26A desk stand.

11853 Rack Mounting Assembly for two 525 power
supplies, 3¹/₂ inches high x 19 inches wide x 7¹/₂ inches
deep. Finish, green.

**169A
SHOCK MOUNT
WITH 29B
MICROPHONE
AND 175A BASE**



**166 A
ATTACHMENT
WITH 29B
MICROPHONE
AND 175A BASE**



GENERAL DESCRIPTION

The "Lipstik" microphone system is designed to work with any existing microphone preamplifier regardless of the input impedance. Aside from the outstanding advantages of this microphone, it differs from the conventional only in that the 525A Power Supply must be connected between microphone and amplifier. The 175A Base, containing the 5840 vacuum tube and 29B Microphone, is terminated at the end of a 15 foot cable in a Cannon connector which mates with a fitting on the 525A. Extension cables are described below. A 15 foot 2-conductor shielded output cable is attached to the power supply. The power supply must be energized from the 117 v 50-60 cps supply.

The 166A slip-in Holder of high impact Styrene mounts the 175A Base and provides a light streamlined swivel attachment with $\frac{5}{8}$ "-27 thread for floor or desk stand.

The 169A Shock Mount, also equipped with swivel and $\frac{5}{8}$ "-27 thread, insulates the microphone effectively from noises transmitted through the floor stand or microphone boom.

The 170B Wind Screen designed for maximum wind and blast protection and for minimum interference with the excellent response of the microphone, clamps between the microphone and the base. Its use is suggested in outdoor applications, or when the microphone is subjected to movement on a boom mount, or to protect against breath blast in any close talking use.

OUTPUT CONNECTIONS Unbalanced:

As supplied, the 525A Power Supply is equipped with a plug installed in the transformer socket which connects the output cable to the cathode follower, through isolating resistor and condenser, for use when the following amplifier has a high impedance or unbalanced (transformerless) input. It may also be operated into amplifiers having low impedance input connections where line balance is not of importance and a small reduction of sensitivity can be tolerated. When the plug is inserted, the black wire of the output cable is ground, thus is common with the shield. The unbalanced output (no 4665 transformer) requires termination when working into transformer loads of 600 ohms or less. A $\frac{1}{2}$ watt resistor matching the transformer impedance within $\pm 20\%$ should be connected across the power supply output. This may be installed in the connector which the user will attach to the output cable. **Balanced:**

Broadcast and recording applications normally require balanced or ungrounded lines for suppression of longitudinal noise currents. This feature is provided by means of a plug-in transformer (4665) which may be inserted in the 525A (installation instructions are given under 525A Power Supply). As shipped the socket is strapped to provide a load impedance of 150 ohms. Other load impedances of 30 and 600 ohms may be obtained by re-strapping the socket as indicated on the transformer schematic. Because of the great latitude in loading permitted by the cathode follower, it is suggested that all load impedances between 30 and 250 ohms be fed from the 525A without modification of the transformer socket strapping. When the 4665 balancing transformer is used, no termination other than that provided by the input transformer of the following amplifier is required. **SENSITIVITY**

The voltage developed at the grid of the first tube following the 525A power supply, for a given microphone signal input, will be identical for all balanced line impedances where the amplifier input is matched, using the 4665 transformer. It will have the same value when the unbalanced (direct cathode follower) output is fed into the first tube of an amplifier not having an input transformer. However, when the unbalanced output is fed into low impedance transformers and loaded with a resistor, as described under UNBALANCED OUTPUT CONNECTIONS, the sensitivity will vary depending upon the load impedance. With a 600 ohm resistor termination working into a 600 ohm transformer, the voltage will be comparable to the above; with a 150 ohm resistor and 150 ohm transformer, the voltage will be 4 db lower and with a 30 ohm resistor and 30 ohm transformer the voltage will be 10 db lower. These sensitivities are listed in the specifications relative to microphone inputs of 10 dynes/cm².

EXTENSION CABLE

The cable length supplied with the 175A Base is 15 feet. Heavy duty, 25' extension cables are available as listed, or single lengths of Surprenant 5426 or equivalent six-conductor cable may be utilized to separate microphone base and power supply up to 400 feet. Beyond 400 feet, larger conductors should be used for the heater loads to avoid excessive voltage drop. **29B**

MICROPHONE

The condenser microphone produces voltages in response to sound pressure through the variation of capacity between moving diaphragm and a stationary electrode connected to a source of polarizing voltage through an extremely high resistance. For the 29-B, the potential is 60 volts and the charging resistance is the input resistance of the associated vacuum tube. The output is proportional to the diaphragm displacement independent of frequency for all frequencies above those at which the microphone reactance is commensurate with the charging resistance. The capacitance of the condenser is approximately 50 mmf. Because of this high internal impedance, it is necessary to place the cathode follower tube, which serves as an impedance transformer, in close proximity to the microphone.

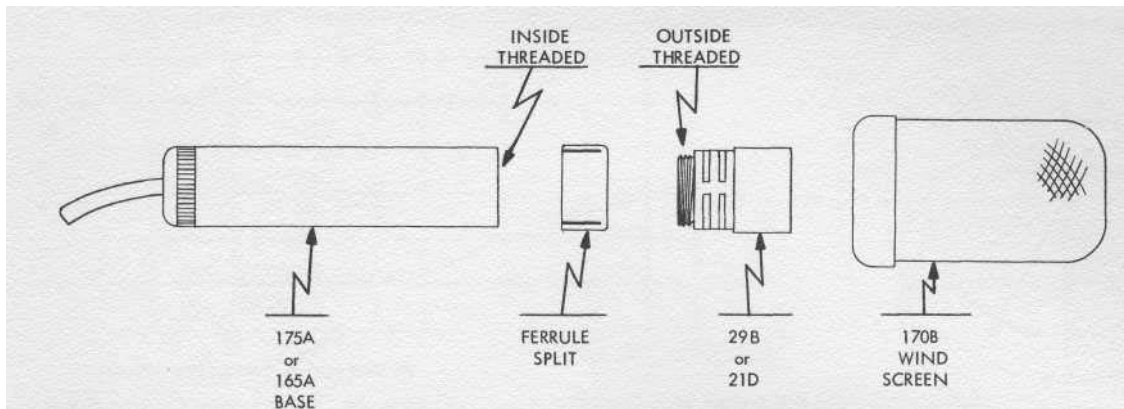
To achieve a uniform cardioid characteristic the sound pressure acting on the backside of the diaphragm passes through a multiple acoustic phaseshifting network. The network allows optimum phaseshift adjustment over the whole frequency range. To provide sensitivity the diaphragm is made of .00025 Mylar, goldplated and stretched to a resonance frequency of approximately 1500 cps. The movement of the diaphragm is resistance controlled by the thin air film between diaphragm and backplate. Due to the low resonance frequency the applied polarizing voltage may not exceed 60 v. Higher voltages may cause the diaphragm to collapse on the backplate and the microphone to become inoperative, although undamaged. **175A BASE**

The base performs the multiple purpose of mounting the microphone, housing the tube, and enclosing the cable connections to the tube. The inner structure of this assembly employs a printed circuit phenolic sleeve which supports the tube socket, providing solder terminating areas for cable wires and tube socket tabs, as well as providing the interconnecting wiring between socket and cable. The gold plated contact pin at the apex of the assembly is supported by a phenolic bearing cemented into the center hole of the socket and is connected to the grid by means of the compression spring which surrounds the pin. The cable clamp assembly consists of a special "O" ring, a brass washer, the clamping nut which completes the case contour, and a gold plated brass part which supports the printed circuit sleeve and provides threads for mating the outer shell with the clamping nut. The cable shield and ground wire solder to the brass part and complete the connection to the microphone case through the outer aluminum shell. The Tensolite 1883-H6 cable which is part of the base is a six-conductor shielded wire of small diameter and good flexibility, having an overall jacket of woven fiberglass material providing excellent abrasion resistance. The Cannon RWK-6-22C connector contains a $\frac{1}{4}$ W 22 K deposited carbon resistor which establishes the polarizing voltage of 60 v. This resistor is the only basic difference between the 175A and the 165A Base used with 21-type microphones. **525A**

POWER SUPPLY

This unit, by means of a transformer, dry disc rectifiers and filters, supplies direct current potentials for operation of the 5840 cathode follower tube and condenser microphone in the 175A base. The shorting plug must be removed when the line balancing transformer is used. When the transformer is inserted, two holes in the chassis line up with threaded inserts in the transformer. The transformer should be secured to the chassis using the two screws furnished.

170B WINDSCREEN



170B WINDSCREEN ... The 170B windscreen has been developed for the M-20 and M-30 Altec microphone systems and is extremely effective in wind noise reduction and "Pop" elimination. The 170B windscreen will attenuate wind noise approximately 24 db without deteriorating the HF response, or discrimination in the case of the M-30 usage. An exploded view, Fig. 1, is shown to aid in the installation of the 170B windscreen. Remove the condenser microphone from its base by unscrewing it counter-clockwise.

Caution: The microphone unit 29B or 21D is a precision element and extreme care should be exercised in handling. Under no circumstances permit anything to touch the contact end of the microphone — the end unscrewed from the base — as this could result in damage to the microphone unit.

Slip the split ferrule over the base with the split end toward the cord on the base. Replace the condenser microphone in the base, inside the ferrule. The windscreen may now be slid over the condenser microphone and onto the ferrule until it 'bottoms.' It will be noted that the ferrule is split to provide tension on the windscreen and holds it firmly in place regardless of the position of the microphone and still allows it to be used with any base or stand accessory. If, for any reason, it should be desired to operate either the M-20 or M-30 Altec microphone system without the 170B windscreen (after it has been installed), it may be removed without detaching the split ferrule.

The "Pop," or explosive sound produced by most people when pronouncing the letter "P" and sometimes "B" in certain words, is effectively reduced with the 170B windscreen and therefore greatly increases the ease of close proximity work.

MODIFICATION

Of M20 System for the use of the 29 B Microphone:

The 29B Microphone requires a 60 v polarizing voltage, as compared with 200 v for the 21 D Microphone. M20 Systems may be modified in any of three ways to provide the 60 v polarizing voltage:

- 1.) Parallel resistor R4 in the 525 with a 22,000 ohm $\frac{1}{4}$ watt deposited carbon resistor.
- 2.) Solder the resistor between pins 4 and 6 of the Cannon Connector RWK-6-22C terminating the cable of the 165A Base. This modification converts the 165A to a 175A Base.
- 3.) Insert, in the microphone cable, an adaptor consisting of an RWK-6-22C and an RWK-6-21C connected together with the resistor connected as in (2).

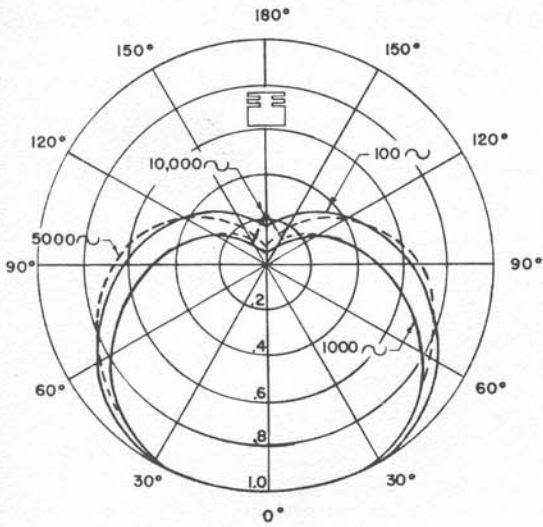
SERVICE DATA:

Caution: when removing the cover from the 525A power supply or the outer shell from the 175A Base, disconnect the power supply from the power line. The metal condenser cans in the power supply are at a positive potential to ground and require approximately two minutes to lose the charge after the system is disconnected. If the system fails to operate and the pilot lamp does not glow, check power line connection and fuse located inside the chassis. If system operates but produces loud hum when the base or microphone is touched, it is an indication of a poor ground connection between the microphone case and the cable end of the assembly. To correct, tighten microphone and shell.

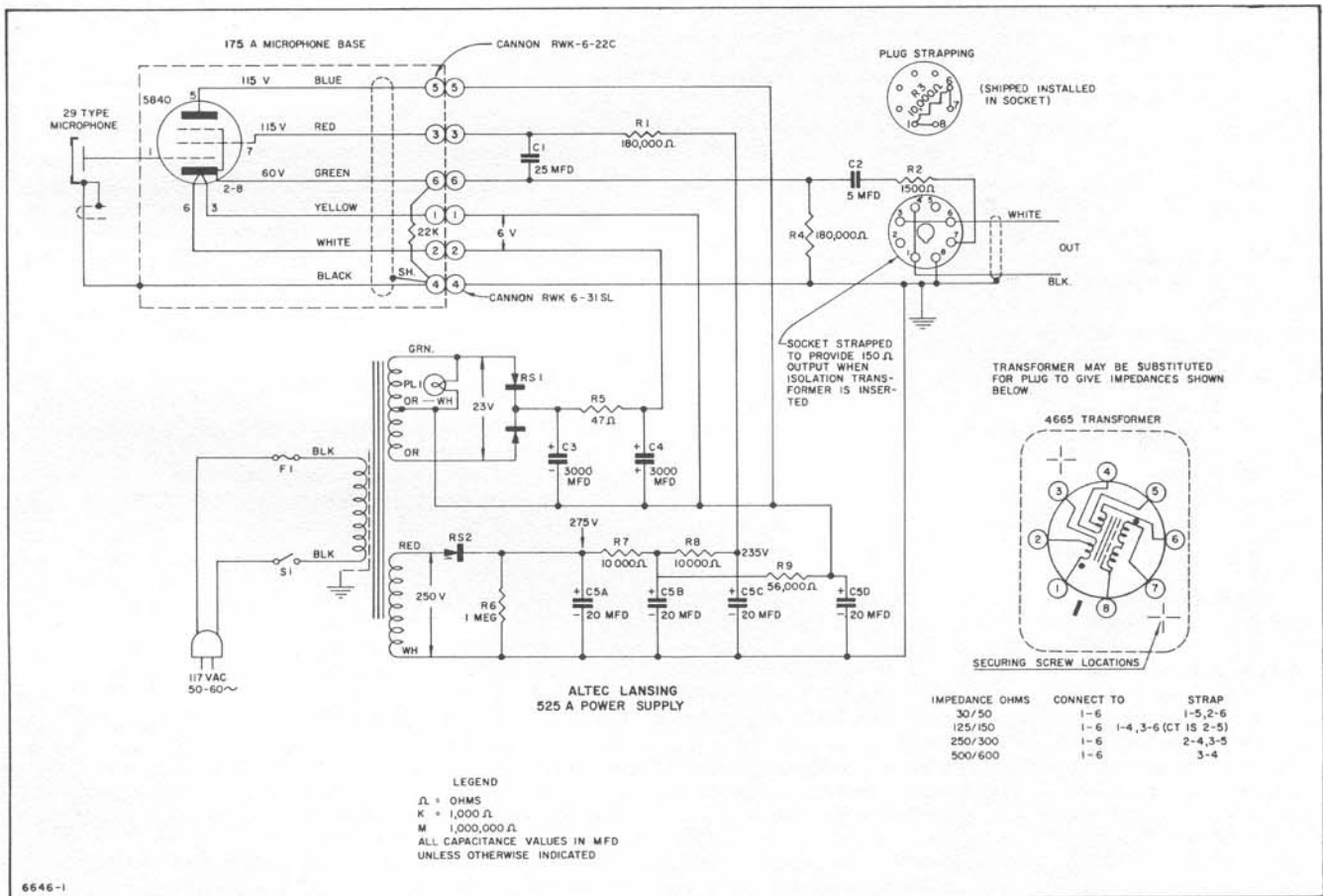
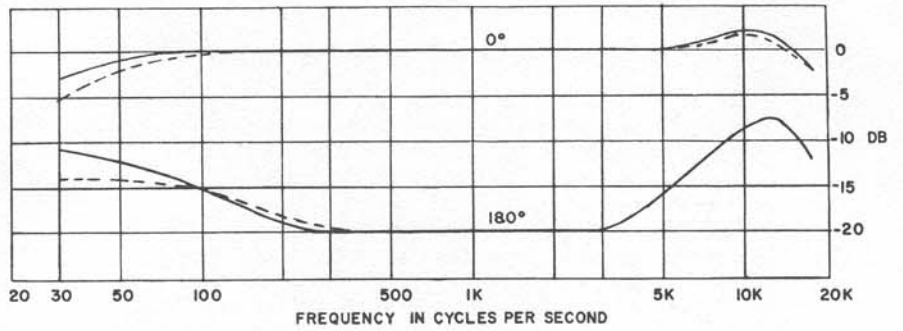
If the system is inoperative, but the power supply is producing normal heater and B supply voltages, the potential across R4 should be measured. R4 is the cathode load resistor for the 5840 tube in the 175A base. With the base disconnected from the power supply, no potential should exist. With the base connected and the microphone button either on or off of the base, the potential across R4 should be a nominal 60 volts. If this potential is not obtained, the 5840 vacuum tube is faulty or a cable short or open exists. If the 60 volts is obtained with the microphone button removed from the base, but not when it is connected, the microphone backplate has accumulated moisture. This sometimes occurs when the microphone has been stored in atmospheres approaching 100% humidity. The condition will sometimes correct itself in a short time due to the heating effect of the vacuum tube. If not, the microphone button can be removed from the base and placed in a ventilated 100° F. oven for a period of several hours.

The shell of the 175A base may be easily removed for inspection by holding firmly the knurled cable clamp nut and unscrewing the upper shell and microphone. It is recommended that the microphone not be removed from the base unless absolutely necessary. When it is removed, fingers and dirt should be kept away from the back plate surface and the breath, which contains moisture, should not be used to blow the assembly clean. The 5840 vacuum tube is a premium type designed for dependable performance under conditions of shock and vibration. On withdrawing the tube, the tip end should be depressed into the sleeve until the pins clear the socket allowing it to be tilted out the larger opening in the sleeve. When re-inserting the tube, the same procedure should be used, entering the tip end of the sleeve first and depressing until the pins clear the opening, allowing alignment with the socket. When the shell is removed from the base, extreme care should be exercised to protect the spring loaded contact pin at the apex of the assembly from damage. Before reassembling, the vinyl insulator surrounding the soldered tube socket connections should be checked, as this is the only insulator between this point and the outer shell. The cable attached to the base may be replaced in the field, if necessary. The cable clamp is released by holding the upper gold plated brass part by means of a length of $\frac{1}{8}$ inch diameter drill rod entered in the radially located hole and unscrewing the knurled nut using pliers with padded jaws. Connections to the printed circuit may be soldered using a minimum of heat and preferably using low temperature solder for the purpose such as National Lead Co. No. 604-AG. When reassembling the clamp, the $\frac{1}{8}$ " diameter drill rod serves also as a gauge, the knurled aluminum nut being tightened until it touches the rod.

POLAR CHARACTERISTIC
29 B MICROPHONE



M-30 MICROPHONE SYSTEM
TYPICAL FREQUENCY RESPONSE — WITHOUT WINDSCREEN
--- WITH WINDSCREEN



PARTS LIST

C1	.25 mfd., 400 V $\pm 20\%$, Hopkins 15-391-4	R6	1 megohm $\pm 10\%$, 1/2 watt
C2	5 mfd., 200 V. $\pm 20\%$ Electrocap AE-10286	R9	56,000 ohms $\pm 10\%$, 1/2 watt
C3, 4	3000 mfd., 15 V., Mallory WPO42	RS1	Fansteel BB-083M
C5	20-20-20-20 mfd., 450 V., Mallory FP444	RS2	I.R.C. 19PA20
R1, 4	180,000 ohms $\pm 10\%$, 1/2 watt	PL1	#1488 lamp
R2	1500 ohms $\pm 10\%$, 1/2 watt	F1	1/2 amp 3AG Littelfuse 312.500
R3, 7, 8	10,000 ohms $\pm 10\%$, 1/2 watt	S1	H & H 1561
R5	47 ohms $\pm 10\%$, 4 watts	T1	Power Transformer. Altec 6068