

MODEL VOX-15

TELEPHONE TALK BACK AMPLIFIER

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS AMPLIFIER TO RAIN OR MOISTURE.

DESCRIPTION

Model VOX-15 is a solid state paging amplifier with a voice activated relay. The combination of a VOX-15 and speaker or speakers when used in place of a telephone set in a private exchange provides "hands free" talk-back in telephone systems where loudspeaker communication is required.

Model VOX-15 is recommended for warehouse and shipping locations as well as production or assembly line areas where there is no high ambient noise. It is not recommended for use in locations such as auto body shops or machine shops. The input to the VOX-15 from the telephone circuits may be made through a standard PAX or Switchboard connection such as "Dial Access" or "Com Line Access". The output of the amplifier is 15 watts at 25 volts for use with a 25 volt speaker line or a 45 ohm paging/talkback speaker. Horn speakers should be used for best results.

Model VOX-15 has separate front panel controls for the speaker and phone volume. A screwdriver adjust control on the rear panel permits adjustment of the turn-off delay in the relay circuit. This delay circuit allows the relay to stay activated during short pauses in speech. The unit is equipped with a circuit breaker to protect the internal circuitry against possible damage caused by overload or accidental shorts.

The VOX-15 may be mounted in a 3-1/2" vertical panel space in a rack, using a Raymer RPK-6 rack mounting kit.

UNPACKING

The unit is to be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of any damage which might have occurred in shipment, immediately notify your supplier, or the transportation company which delivered it. Claims for damage sustained in transit must be made upon the carrier. Save all packing material for inspection by the claim agent who will furnish you with the proper forms and will also give you the necessary instructions for filing a claim.

TECHNICAL SPECIFICATIONS

PAGING OUTPUT

POWER OUTPUT (RMS at 1KHz)	15 W at less than 2% total harmonic distortion
OUTPUT IMPEDANCE	25 Volt line or 41.7 ohms
FREQUENCY RESPONSE	350Hz to 5KHz +0db -3db
HUM AND NOISE	55db below rated output
INPUT IMPEDANCE	600 ohm balanced
INPUT SENSITIVITY	800 mV for full output

PHONE LINE OUTPUT

POWER OUTPUT (RMS at 1KHz)	100 mw
OUTPUT IMPEDANCE	600 ohms
FREQUENCY RESPONSE	300Hz to 3KHz +0db -3db
HUM AND NOISE	65db below 100 mw
INPUT IMPEDANCE	45 ohms balanced
INPUT SENSITIVITY	0.8 mV

SPECIFICATIONS

VOX SENSITIVITY	50 mV at Phone input to activate relay
DELAY RANGE	50 msec to 400 msec
CONTROLS	1 - page level, 1 - phone level, 1 - delay (screwdriver adj), 1 - power switch
CIRCUIT PROTECTION	Push-to-Reset circuit breaker
POWER CONSUMPTION	120 V AC 60Hz 40 watts
SEMICONDUCTORS	11 silicon transistors, 8 silicon diodes, 5 switching diodes, 1 LED
DIMENSIONS	12-3/8" x 8-1/4" x 3-1/8"
RACK MOUNT	RPK-6
SHIPPING WEIGHT	8 lbs.

INSTALLATION:

Because of its attractive appearance this unit may be placed on a table or a shelf. Although the unit has ample vents for normal ventilation, sufficient space should be allowed around to permit free air flow. **DO NOT PLACE** it on top of vacuum tube equipment. **DO NOT STORE OR OPERATE** it in areas where the ambient temperature exceeds 140 degrees Fahrenheit. If installed in a cabinet, ample ventilation must be allowed around the unit.

The VOX-15 may be mounted in a 3-1/2" vertical panel space in a rack, using a Raymer RPK-6 rack

PRINCIPLE OF OPERATION

The VOX-15 consists of a 15 watt audio amplifier, a relay to reverse its input and output connections and a direction sensing circuit to activate the relay. A block diagram of the VOX-15 is shown in Figure 1.

In the de-energized position the relay connects the speakers in the system to the input of the amplifier and connects the output to the phone line. In this mode, the speakers act as a microphone input. When a telephone circuit is connected to the VOX-15 by means of a dial access or comm line arrangement, the amplified sound in the speaker area is heard in the telephone receiver. When the calling party speaks into the telephone mouthpiece, the voltage generated is detected by the direction sensing portion of the VOX-15 and activates the relay.

In the activated mode, the relay connects the phone line to the input of the amplifier and the output is connected to the speakers. A delay circuit is included in the relay driver circuit to keep the relay activated during brief pauses in speech. Since the direction sensing circuit depends upon the balance of a bridge, the PHONE LEVEL control must be adjusted such that the sound heard in the telephone receiver is approximately the same level in both the listen and talk modes.

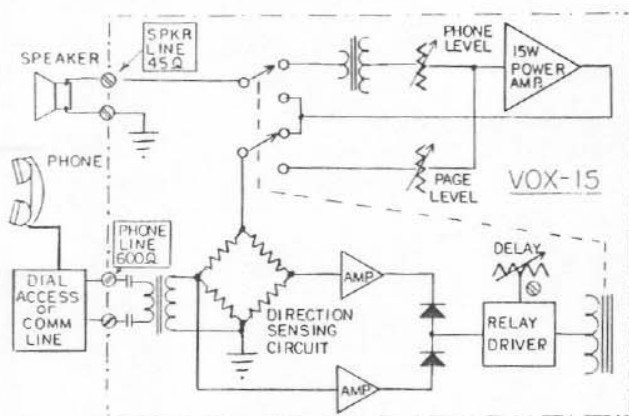


FIGURE 1: BLOCK DIAGRAM OF VOX-15.

CONNECTIONS

All connections are made on the rear panel of the unit.

SPEAKER CONNECTIONS

The speaker line impedance of the VOX-15 is 45 ohms. This speaker line may consist of a single 45 ohm Paging/Talk-back speaker or several speakers with 25 volt matching transformers connected for a total power rating of 15 watts. For best results horn speakers should be used. To avoid inducing hum into the system do not run the speaker cable parallel to any AC power line cables.

Since the speakers are used as microphones in the listen mode, their placement is very important. Speakers should be placed in such a way that they face directly towards the person answering the page. The speakers should also be mounted at a sufficient height to avoid any obstruction between the speaker and the answering party.

Speakers should not be placed near noise sources such as blowers, fans, air ducts, etc. High noise levels picked up by the speakers will bias the direction sensing

circuit of the VOX-15 and require the calling party to speak more loudly into the telephone to make the unit switch to the page mode.

TELEPHONE CONNECTIONS

The phone line input/output of the VOX-15 has an impedance of 600 ohms and is designed for a dial access or comm line access arrangement in an internal telephone exchange. The circuit is for audio voltage only. *Do not apply ring voltage to these terminals.*

This circuit has no DC continuity and is designed for telephone switching circuits that do not require a holding loop across the called line. When connected to a telephone switching arrangement that requires a supervisory holding loop, a suitable load must be added across the phone line to match the telephone switching requirements.

Phone line access to the VOX-15 should be limited to telephone instruments that are not in the area covered by the paging speakers, otherwise severe acoustic feedback may occur.

OPERATION

There are two control knobs and a toggle switch located on the front panel of the VOX-15. Their functions are indicated as Phone Level, Paging level, and Power ON/OFF.

The power switch turns the unit on and off as shown by the red L.E.D. indicator. The Phone Level control adjusts the listening level heard in the telephone receiver. The Paging Level control adjusts the paging level of the loudspeakers.

The Phone Level control effects the sensitivity of the direction sensing circuit and should be adjusted such that the sound level heard in the telephone receiver when listening is approximately the same level as heard when talking into the telephone transmitter. If this control is advanced too far, the calling party will be forced to raise their voice in order to make the unit page. When there is a high noise level at the speaker the calling party may be unable to make the unit page. This situation may be relieved by reducing the Phone Level Control and having the answering party talk louder and stand closer to the speaker. The Page Level control has very little effect on the sensitivity of the direction sensing circuit of the unit.

There is a screwdriver delay adjustment and Push-to-Reset circuit breaker button the the rear panel of the unit. The delay adjustment keeps the relay energized during brief pauses in speech. Turning this adjustment counter clockwise shortens the delay period and turning it clockwise increases the delay period.

The circuit breaker located on the rear panel protects the unit against internal damage that could be caused by overload or accidental short circuits. If this circuit breaker "trips" the red L.E.D. indicator on the front panel will go out even though the power switch is ON. To reset the breaker, momentarily depress the red button.

IN THE EVENT THAT THE CIRCUIT BREAKER CONTINUES TO TRIP, DO NOT ATTEMPT TO DEFEAT THE FUNCTION OF THE CIRCUIT BREAKER. HAVE THE TROUBLE INVESTIGATED BY A QUALIFIED SERVICE TECHNICIAN OR RETURN THE UNIT TO THE FACTORY.

MAINTENANCE

Since the VOX-15 is solid state and contains no vacuum tubes, it should operate for many years without the necessity of any maintenance. Should the unit become suspect of malfunctioning it may be tested by the use of an audio oscillator and AC voltmeter as follows:

TALK BACK SENSITIVITY—with the Phone Line terminals loaded with a 500 ohm resistor and a 1000 hertz oscillator set at 1 millivolt connected to the speaker terminals, measure the voltage across the phone line. With both level controls full clockwise, this reading should be approximately 100 millivolts.

PAGING SENSITIVITY—with the speaker output terminals loaded with a 50 ohm 25 watt resistor and a 1000 hertz oscillator set at 1 volt connected to the phone line terminals, measure the voltage across the speaker line. With both level controls full clockwise this reading should be at least 25 volts.

RELAY SENSITIVITY—with a 1000 hertz oscillator connected across the phone line terminals measure the oscillator voltage required to activate the relay. This voltage should be approximately 50 millivolts. Repeat this test with both level controls fully clockwise and counter clockwise; there should be no change in relay sensitivity.

RELAY MAINTENANCE

CAUTION—RELAY MAINTENANCE REQUIRES THAT THE COVER OF THE UNIT BE REMOVED. REFER SERVICING TO A QUALIFIED TECHNICIAN. BE SURE THE POWER CORD IS DISCONNECTED BEFORE REMOVING THE COVER.

The relay is a sealed unit with precious metal contacts designed for long life and dependability. Should the relay fail, it should be replaced with a relay of equal quality. The relay cannot be serviced or repaired. The suggested replacement relay is the Potter & Brumfield Model R10-E1-X2-V700 24VDC.

To replace the relay disconnect the power cord of the unit and remove the cover by removing the four screws on the sides of the cover. The relay is located in a plug-in socket on the printed circuit board. To unplug the relay the hold-down spring across the top of the relay must be moved out of the way. This is done by sliding the top of the spring toward the front of the unit until the spring is clear of the relay top. The relay may be removed by pulling it directly upward. Care must be taken when inserting the new relay to make sure that all of the connector pins go directly into the socket and that none get bent over. Replace the hold-down spring and replace the cover before reconnecting the power cord.

WARRANTY

THIS UNIT HAS BEEN VERY CAREFULLY INSPECTED AND IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE FOR A PERIOD OF ONE YEAR FROM DATE OF SALE TO THE ORIGINAL PURCHASER. THIS WARRANTY DOES NOT EXTEND TO ANY UNIT WHICH BEEN SUBJECT TO ABUSE, MISUSE, NEGLECT, ACCIDENT, IMPROPER INSTALLATION, OR ALTERATIONS. THE OBLIGATION OF CETEC RAYMER UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OF ANY DEFECT IN MATERIAL OR WORKMANSHIP AND/OR THE REPLACEMENT OF ANY DEFECTIVE PART, PROVIDED THE UNIT IS RETURNED TO CETEC RAYMER TRANSPORTATION PREPAID.

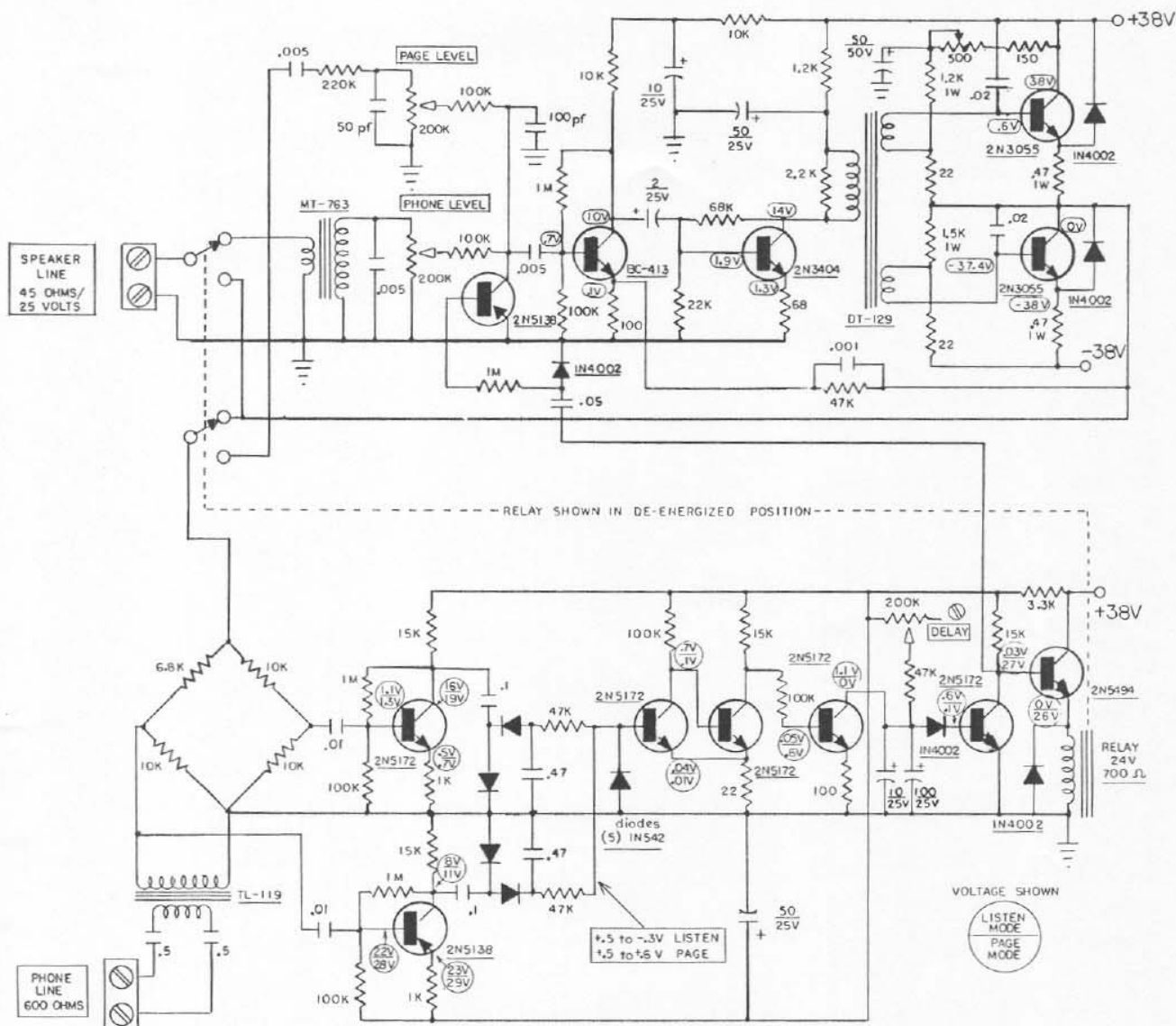
IT IS RECOMMENDED THAT ANY UNIT ON WHICH SERVICE IS REQUIRED BE PROCESSED THROUGH YOU DISTRIBUTOR OR INSTALLATION COMPANY WHEREVER POSSIBLE.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON OUR PART. WE NEITHER ASSUME NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE PRODUCTS MANUFACTURED BY CETEC RAYMER.

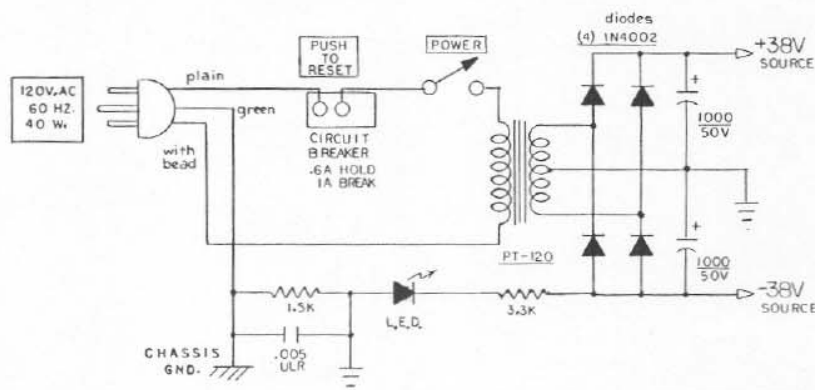
MANUFACTURED IN THE USA BY

 **Cetec Raymer**

Cetec Raymer Commercial Sound Products
Division of Cetec Corporation
7315 Fulton Ave., No. Hollywood, CA 91605 • (213) 875-0423



- NOTES:
1. RESISTOR VALUES SHOW IN OHMS.
 2. RESISTORS 1/2 WATTS UNLESS OTHERWISE INDICATED.
 3. CAPACITOR VALUES SHOWN IN MF. EXCEPT WHERE INDICATED.



Cetec Raymer Division of Cetec Corporation
7318 Fulton Avenue • North Hollywood, California 91607

SCHEMATIC:

RAYMER MODEL VOX-15
15 WATT TELEPHONE TALKBACK AMP.