

BOGEN[®]

COMMUNICATIONS, INC.

PAGING/TALKBACK AMPLIFIER

TBA-15

INSTALLATION AND ADJUSTMENT INSTRUCTIONS

FCC Registration No. under Part 68 Rules: CD272Q-17147-KX-N
Ringer Equivalence: 0.0B

The Bogen Model TBA-15 is a fifteen-watt paging/talkback amplifier which complies with Part 68 of FCC rules. The unit permits two-way communication between a telephone handset, and one (or more) zone(s) of remote loudspeakers. When used with optional Bogen accessories, paging to up to nine separate zones of loudspeakers is possible.

The TBA-15 senses and automatically switches the direction of conversation from telephone to loudspeaker without the use of relays or other moving parts. Control of speech direction is maintained at the telephone handset. Controls are provided to adjust the switching sensitivity, switching delay, and loudspeaker and talkback (handset) volume levels.

The TBA-15 has a talkback frequency response which has been shaped for maximum intelligibility and background noise rejection. Switching delay time is adjustable from less than 50ms to greater than 0.5 seconds to ensure an intelligible flow of conversation.

A "power on" LED, circuit breaker, and speaker volume control are located on the front panel. A recess in the panel, protected by a removable cover, houses the 600-ohm transformer-coupled telephone line input, 25V and 70V constant voltage outputs, and muting terminals (for one-way paging). Controls to adjust sensitivity, switching delay and talkback volume are also located within the panel recess.

The amplifier operates from a 120 volt, 60Hz, AC source. A press-to-reset circuit breaker protects the unit from excessive current flow. Safe Operating Area (SOA) and thermal protection safeguard the output device. The unit is finished in textured black enamel and mounts easily on a wall backboard or in standard 19" equipment racks.

INSTALLATION

Warning

To prevent fire or shock hazard, do not expose this equipment to rain or moisture. There are no user-serviceable parts within this equipment. Removal of the cover presents an electrical shock hazard. Have all internal service performed by qualified service personnel.

UNPACKING: This equipment was carefully checked before leaving the factory. Inspect the unit and shipping carton for indications of improper handling. In case of damage, make an immediate claim to the dealer or distributor from whom the unit was purchased. If the unit was shipped to you, notify the transportation carrier without delay and place a claim.

MOUNTING: Avoid proximity to heat sources and strong magnetic fields. Provide for adequate ventilation for chassis heat dissipation. To eliminate possible cross talk interference, do not run input and output lines close together and route through separate knockouts on the terminal strip cover.

For wall-mounted installation, locate two top screws 18-5/16" apart, allowing the screw heads to protrude 1/8" to 1/4". Fit the chassis onto the screw heads at the keyhole slots and position two bottom screws. Complete the installation by tightening all screws securely. For best support, use self-fastening hardware when mounting the unit to plasterboard or similar thin materials. The unit weighs 7 lbs.

For rack-mounted installation, install the unit facing into the rack. A blank panel may be used to cover the exposed rear surface of the amplifier. Secure the unit and blank panel with the same screws.

POWER AND GROUNDING: The AC line cord is terminated in a three-prong plug, which should be plugged into a three-wire, grounded outlet. It is important to ground the amplifier properly. "Pigtail" adaptors may be used *only* when properly connected to a grounded outlet. A front panel LED illuminates when power is applied to the unit.

CONNECTIONS

All connections to the TBA-15 are made through a screw terminal strip (Figure 1), located within a recess on the amplifier front panel. Keyhole slots on the recess cover allow for quick access to terminal connections. Knockouts are provided on the cover to admit wiring. Run input and output wiring through separate knockouts.

THE FOLLOWING INFORMATION IS REQUIRED BY PART 68 OF FCC RULES TO BE SUPPLIED TO THE PURCHASER OF REGISTERED EQUIPMENT.

This equipment complies with Part 68 of FCC rules and regulations. The FCC registration number and ringer equivalence number are printed on the front panel of this equipment. You must, upon request, supply this information to your telephone company.

If this equipment causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible they will notify you in advance. If such notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until it is determined that the equipment is not malfunctioning.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that may affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

Note that for all applications of this equipment, coin service and party lines may not be used.

This equipment is typically used as an adjunct device to other registered equipment (i.e., PABX, LA2 KEY, or Electronic Key Systems). Such host equipment may be leased. If so, permission of the owner should be obtained prior to installation of this equipment.

If you experience trouble with this equipment, please contact the Service Department of Bogen Communications, Inc., at 50 Spring Street, Ramsey, New Jersey 07446, telephone (201) 934-8500. Information will be provided regarding service or repairs.

TELEPHONE LINE: The TEL LINE terminals are a 600-ohm transformer-balanced telephone side connection (dry signal only, no loop current). In typical applications with a single paging zone, this line interfaces with a station port or trunk port of an in-house telephone system (via the Bogen Model TAM, Telephone Access Module, or other suitable interface) and is reached by dialing a number reserved for paging.

LOUDSPEAKERS: The TBA-15 provides 25V and 70V constant-voltage speaker outputs for balanced systems. Use two-conductor shielded cable with insulation over the shield. Connect one conductor to the 25V or 70V terminal and the other conductor to the COM terminal. Connect the cable shield to the GND terminal. The total speaker load should not exceed 15 watts.

MUTE: The TBA-15 may be configured for unidirectional (telephone to loudspeaker) operation, if desired, by connecting the +MUTE terminal to the -MUTE terminal. The +MUTE terminal is a current limited (by a 1 kilohm resistor) 15 volt supply provided primarily to control the talkback mute feature; however,

it may be used to supply power to auxiliary equipment (e.g., TAM external VOX enable). The -MUTE terminal is the talkback mute control terminal. +5VDC or greater (referenced to the GND terminal of the TBA-15) applied to this terminal will defeat the talkback feature.

CONTROLS

OUTPUT VOLUME: Controls the volume at the loudspeaker. Clockwise rotation of the control increases the level; counterclockwise rotation decreases the level.

TALKBACK VOLUME: Adjusts the talkback volume level in the handset earpiece. Clockwise rotation increases the level; counterclockwise rotation decreases the level.

SWITCHING SENSITIVITY: Adjusts the point at which the VOX circuit will switch from talkback to talk modes. Clockwise rotation increases sensitivity; counterclockwise rotation decreases sensitivity.

TECHNICAL SPECIFICATIONS

TELEPHONE TO LOUDSPEAKER

Rated Power Output: 15 Watts
Frequency Response: 200Hz to 10kHz
Input Sensitivity: -20dBm
Input Impedance: 600-ohms, balanced
Distortion (@RPO): Less than 3% (150mV input signal)
Signal-to-Noise Ratio: -50dB (20Hz to 20kHz)
Voice Activated Switching:
Sensitivity — -46dBm
Attack Time — Less than 5ms (3ms, typ.)
Switching Delay Time — Adjustable from <50ms to greater than 0.5sec.
Constant Output Voltage: 25V or 70V balanced line

LOUDSPEAKER TO TELEPHONE

Frequency Response: 1500Hz to 20kHz
Distortion: Less than 2%
Signal-to-Noise Ratio: -40dB
Output Level: Processed to meet FCC Part 68

GENERAL

Controls:
Loudspeaker Output Volume
Talkback Volume
Switching Sensitivity
Switching Delay
Circuit Overload Protection:
Push-to-Reset Circuit Breaker
Safe Operating Area (SOA) and thermal protection for output device
Unidirectional Operation: Terminals provided to defeat two-way function
Power Requirements: 120V, 60Hz AC @ 0.7A
Temperature Range: 0 - 50°C (32 - 122°F)
Humidity Range: 0 - 95%, non-condensing
Enclosure: Sheet metal finished in textured black enamel
Overall Dimensions: 5-1/4"H x 19"W x 2-7/8"D
(13.3x48.2x7.3cm)
Weight: 7 lbs. (3.2kg)

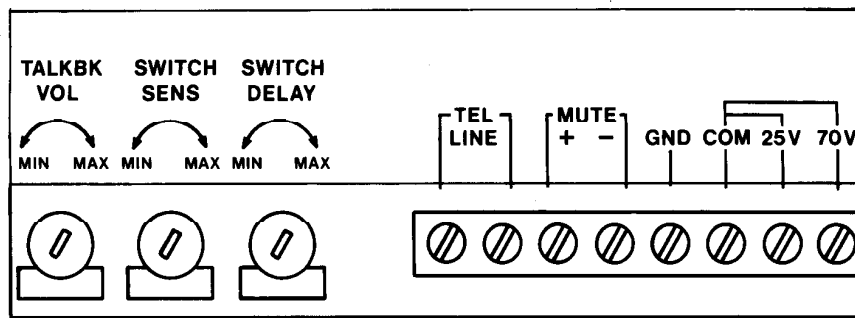


Figure 1 - TBA-15 Terminal strip

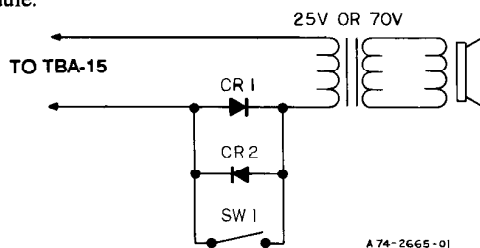
SWITCHING DELAY: Adjusts the release time of the VOX circuit, allowing for short pauses between words without causing the unit to switch to the talkback mode in the middle of a sentence. Clockwise rotation increases the delay; counterclockwise rotation decreases delay.

CONFIGURATIONS

REMOTE PRIVACY: Any remote speaker may be modified for privacy, as shown in Figure 2. When S1 is open, paging announcements from the telephone handset are received at the loudspeaker, but the telephone operator cannot monitor the loudspeaker area.

SINGLE ZONE TALKBACK WITH TAM: A single paging zone, at the trunk or station level, is shown in Figure 3. This configuration uses the Bogen Mode TAM, Telephone Access Module. Note that the power supply (Bogen Model PRS-AS-A) is only required for the trunk access mode.

MULTI-ZONE STATION LEVEL PAGING: The use of a Bogen Zone Paging Accessory permits up to nine zones of paging. Refer to Figure 4. Both one-way and two-way zones may be incorporated in this configuration. Installation instructions are furnished with the module.



NOTES:

CR1 AND CR2 ARE 50 PRV, 1A (IN4001 OR EQUIVALENT).
SW1 IS AN SPST SWITCH.

Figure 2 - Remote Privacy

ADJUSTMENT PROCEDURE

Controls are provided to adjust the performance of the TBA-15. Since these controls interact with each other, the following procedure should be used to set the unit for optimum performance.

Adjusting the performance of the TBA-15 requires two people: one in the talkback zone having the highest background noise level, and one at the amplifier location. Due to the high sensitivity of a telephone mouthpiece, sound from a nearby speaker may cause the TBA-15 to switch. Do not adjust while using a speaker located near the telephone.

Note

Where possible, use only one type of speaker in each zone. Horn-type loudspeakers provide a significantly stronger talkback signal than from a cone-type speaker and, preferably, should be used when this procedure is performed. Also, better results are achieved when speakers are tapped closer to their maximum power.

1. Set the SWITCH SENS control at its full counterclockwise position.
2. Set the SWITCH DELAY control at about mid-rotation.
3. Have the person in the talkback zone speak in a voice loud enough to overcome the ambient background noise level. Rotate the TALKBK VOL control clockwise to obtain an acceptable volume level over the handset. The talkback volume level should be set on the low side to improve intelligibility. Higher settings will tend to muddy the sound, since the background noise will become a significant signal at the telephone.
4. With the person in the paging zone silent, rotate the SWITCH SENS control clockwise until the switching becomes unstable (switches back and forth by itself). Rotate the control counterclockwise until the switching again becomes stable. At this point, the unit is critically stable; any noise on the telephone side will cause the unit to switch to the talk mode and any loud impulse-type noise at the loudspeaker may cause the unit to switch to the talkback mode.
5. With the person in the talkback zone speaking, rotate the SWITCH SENS control counterclockwise so that the unit does not switch.
6. Have the person in the talkback zone make loud impulse noises that may be characteristic of the environment (door slamming, machine noises, etc.). If necessary, make additional adjustments to the SWITCH SENS control so that the unit does not switch momentarily to the talk mode.
7. Speak into the telephone handset in a normal paging voice. The TBA-15 should switch to the talk mode (switching will be apparent by the total absence of background noise in the handset earpiece). If the unit does not switch, increase the sensitivity by rotating the SWITCH SENS control clockwise until switching becomes consistent. Recheck the unit's response to impulse noises (step 6), making sure that the person in the talkback zone is not uncharacteristically close to the loudspeaker.
8. To set the switching delay, start a moderately fast alternate count between the telephone side and the talkback zone. Adjust the SWITCH DELAY control so that the complete response from the talkback zone can be heard. (Clockwise rotation minimizes delay, counterclockwise rotation increases delay.) Then, while speaking into the telephone handset, check the delay to ensure it will allow short pauses between words without switching into the talkback mode. Adjust for a slightly

longer delay if the unit switches between words. A slight pause is generally advisable for speech continuity and intelligibility.

cuit board, also give the component board assembly number, which begins with "45".

MAINTENANCE

CAUTION

There are no user-serviceable parts within the amplifier. To avoid an electric shock hazard, have all internal servicing performed by qualified service personnel only.

CIRCUIT BREAKER: A circuit breaker protects the TBA-15 from shorts and sustained overloads. If it trips, the pilot lamp will go out and the amplifier will have no output. To reset, remove the AC line cord from the wall outlet and press the red reset switch. Plug the AC line cord back into the outlet. If the circuit breaker continues to trip, have the trouble investigated by a qualified technician.

BOGEN SERVICE

We are interested in the maintenance of your Bogen equipment. If trouble develops, do not hesitate to ask our advice or assistance. Information can be obtained by writing to Service Department, Bogen Communications, 50 Spring Street, Ramsey, New Jersey 07446.

When communicating with us, give the model number and series designation of your unit. Describe the difficulty encountered and the effect each operating control has upon the symptoms of trouble. We will send you service information if the trouble appears simple. If the trouble requires servicing, we will send you the name and address of the nearest authorized Bogen Service Agency to which you can send the unit for repairs.

When shipping, use the original carton or a similar container and filler material to prevent damage. Send the unit, fully insured and prepaid, via responsible carrier. The unit will be repaired and returned to you collect (freight prepaid while under warranty).

REPLACEMENT PARTS

CAUTION

Improper soldering may damage components or the printed circuit board, and such damage can void the warranty.

Most components used in the amplifier are standard parts available through reputable parts suppliers. The parts listed here may be obtained from Bogen distributors, service agencies or directly from the factory. When ordering a part, specify a part number, the model of the unit, and give the series designation, which is a letter followed by numbers, printed on the chassis. For parts on the cir-

Ref. No.	Part No.	Description
		<i>P.C. Board</i>
--	45-7343-05	Component Board Assy.
C1	79-119-015	Cap., Elect., 3300 μ F, 63V
C3,18,27	79-126-057	Cap., Elect., 47 μ F, 50V
C5,14,34	79-126-069	Cap., Elect., 1 μ F, 50V
C7,13	79-126-049	Cap., Elect., 470 μ F, 35V
C12,19	79-126-068	Cap., Elect., 100 μ F, 63V
C15	79-126-055	Cap., Elect., 4.7 μ F, 50V
C24,25,35	79-126-058	Cap., Elect., 10 μ F, 50V
C26	79-126-044	Cap., Elect., 1000 μ F, 35V
CR1-4,15,16	96-5333-01	Diode 400prv @ 1A (IN4004)
CR5,8,9,10-12, 17,18	96-5430-01	Diode IN4148
CR6,7	96-5344-02	Diode, Zener 12V, 2W
CR13,14,19,20	96-5344-10	Diode, Zener 5.1V, 2W
CR21	96-5344-15	Diode, Zener 22V, 2W
IC-1,5	96-5595-01	I.C. LM339N
IC-2	96-5648-01	I.C. CA3280AE
IC-3	96-5720-01	I.C. LM1458N
IC-6	96-5649-01	I.C. LM1875T
IC-7	96-5439-01	I.C. LM380N-8
IC-8	96-5658-01	I.C. H11F1
IC-9	96-5468-01	I.C. CD4066BE
IC-10	96-5471-01	I.C. TL072CP
IC-11	96-5690-01	I.C. LM833N
IC-12	96-5441-01	I.C. LM7815T or LM340T15
Q1,5	96-5290-01	Transistor MPS-A05
Q3,4	96-5721-01	Transistor IRF531
Q6,7	96-5722-01	Transistor VN0808M
R4	77-006-001	Trimpot, 1 kilohm
R28	77-001-853	Control, 5 kilohms
R29-31	77-006-004	Trimpot, 10 kilohms
R38	76-155-092	Resistor 1 ohm, 1 watt, 5%
T1	83-478-000	Transformer, Input
		<i>Chassis</i>
--	96-5403-01	LED, Red
CB101	94-0025-03	Circuit Breaker, 1A
T102	83-843-000	Transformer, Power
T101	83-500-000	Transformer, Output

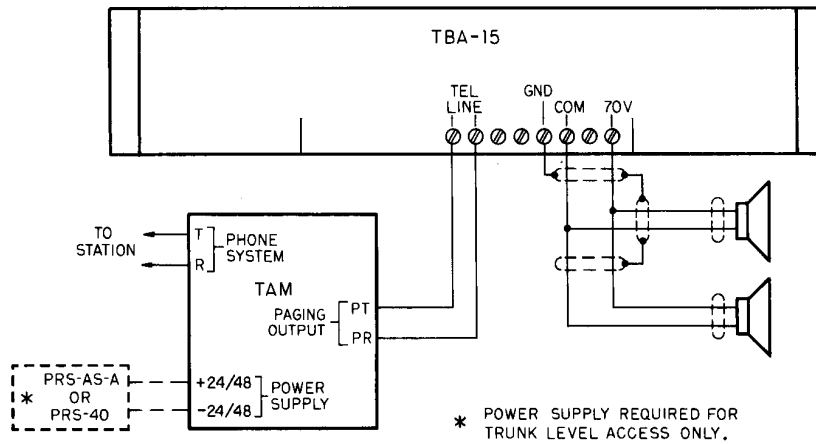


Figure 3 — Single-Zone Talkback with TAM Accessory

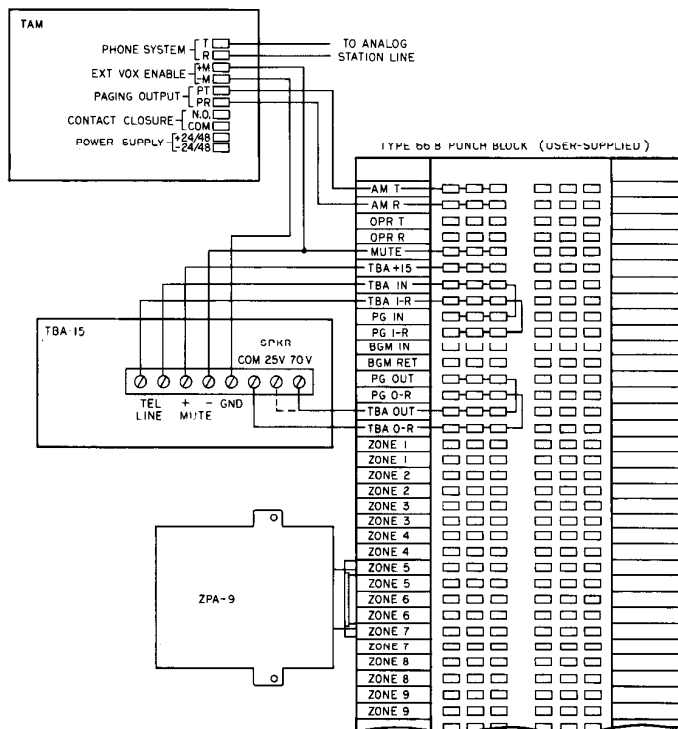


Figure 4 — Multi-Zone Station Level Paging with TAM and ZPA-9 Accessories

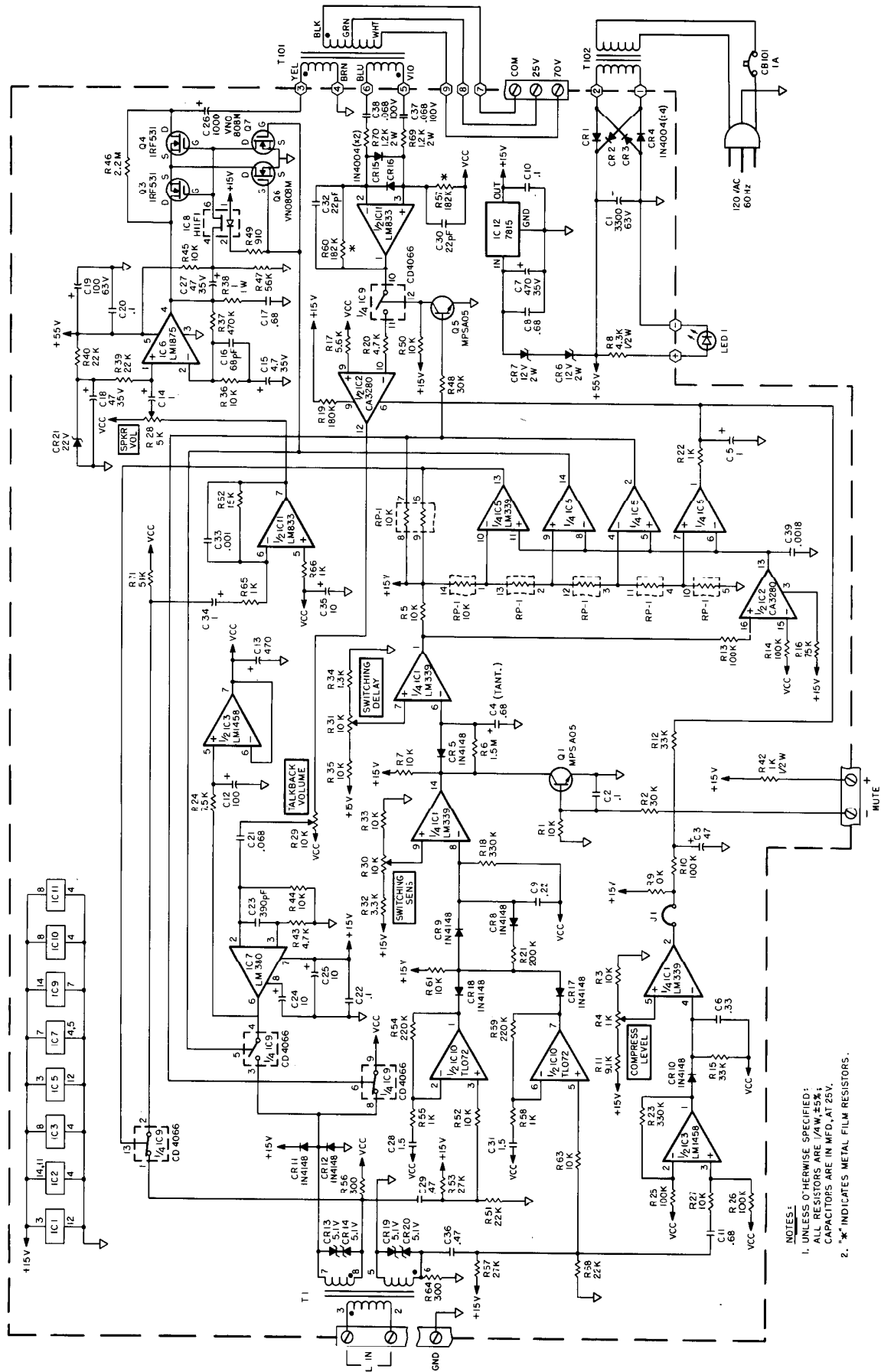


Figure 5 — TBA-15 Schematic Diagram

- NOTES:
1. UNLESS OTHERWISE SPECIFIED: ALL RESISTORS ARE 1/4W, 5%; CAPACITORS ARE IN MFD. AT 25V.
 2. "*" INDICATES METAL FILM RESISTORS.

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