8106–00 and 8106–01 Loudspeaker Sets

CLEI™ Code (8106–00 only): TEUQWO26AA

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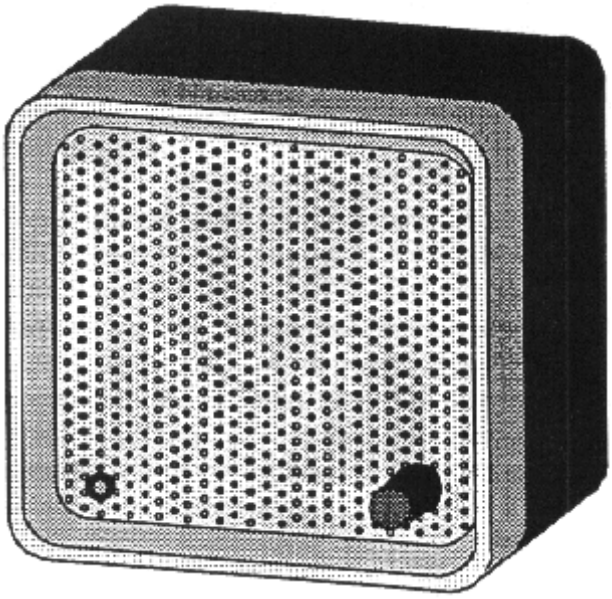

Figure 1. 8106–0X Loudspeaker Set

1. GENERAL

1.1 Document Purpose

This document provides general, circuit description, installation and testing information for the Charles Industries 8106–00 and 8106–01 Loudspeaker Sets, depicted in Figure 1.

1.2 Document Status

This document is reprinted to include a general editorial update.

1.3 Equipment Function

The 8106–0X loudspeaker set is a self-contained unit which amplifies voice-frequency signals to drive its own internal speaker.

1.4 Equipment Location/Mounting

Mounts in a 19- or 23-inch-wide relay rack (with external mounting panel described in Part 4), or desk-mounted (with rubber mounting feet).

1.5 Equipment Features

The 8106–0X provides the following features:

- Volume control with on/off switch and minimum volume option.
- Front panel LED indicates when speaker is on.
- Automatic Gain Control (AGC) circuit which can be optionally disabled.
- Optional speaker mute.

Each 8106–0X is equipped with a 10-foot, 6-conductor cable and is available in two colors, designated below:

Order Number	Color
8106–00	Green
8106–01	Beige

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

3. CIRCUIT DESCRIPTION

Refer to the block diagram (Figure 5) while reading the following circuit description.

3.1 Amplifier

The input signal is connected to either the 2400- or 600-ohm winding of the input transformer (TI) and the signal induced on the secondary winding appears at the SURGE PROTECTION circuitry, which suppresses high voltage transients. The signal is filtered by the LOW PASS FILTER and is applied to the volume control (VOL), which

determines the amplitude of the filtered signal applied to the GAIN AMP. The LOW PASS FILTER may be disabled by a ground on the GRD DISABLE lead to mute the speaker.

The filtered and amplified signal from the GAIN AMP is coupled to the 45-ohm loudspeaker via the VOLTAGE DRIVER and POWER AMP. A portion of the output is also extended to terminal E11 through the RECORDER PAD. This output, a 600-ohm port, is not brought out on the 6-conductor cable: it is used for recording when the 8106–0X is used in a 921 AFCOMPAC system.

3.2 AGC Circuit

When the AGC screw option is closed, a portion of the output from the LOW PASS FILTER drives the AGC amplifier in the AGC CONTROL CIRCUIT. DC offset voltage is filtered out and the remaining AGC signal is doubled and rectified. The output impedance of the conditioned AGC output forms a voltage divider which determines the signal amplitude to be extended to the GAIN AMP. When the signal amplitude in the LOW PASS FILTER rises above the controlled level, the AGC circuitry shunts more of the signal to ground, thereby maintaining the signal amplitude at its controlled level. When the signal amplitude falls below its controlled level, less of the signal is shunted to ground, again maintaining the signal amplitude at its controlled level.

3.3 Power Supply

Input at either –24 or –48VDC is supplied to the 8106–0X via switch Sl. The sensing circuitry in the POWER SUPPLY determines what battery voltage level has been supplied. If 27VDC or less is detected, the nominal –24VDC input is filtered and powers the output transistors. The –24VDC input is divided to provide –12VDC which is used as the reference for the operational amplifiers. If –44VDC or greater is detected, the voltage is dropped to –24Vdc so that the circuitry sees an effective input of –24Vdc. The POWER SUPPLY circuitry protects against accidental reversal of input polarity. The 8106–0X front panel LED lights to indicate that the unit is on.

4. MOUNTING

The 8106–0X Loudspeaker Set is provided with four rubber feet to allow mounting on a desk, table, or other horizontal surface.

The 8106–0X may also be mounted on a 19- or 23-inch wide relay rack by the use of an appropriate mounting panel. These panels may be obtained from Charles Industries in 19- or 23-inch widths having either one or two mounting spaces to accommodate one or two speakers. The order numbers are as follows:

- A92–810800 19-inches wide, 2 mounting spaces
- A92–810801 19-inches wide, 1 mounting space
- A92–810900 23-inches wide, 2 mounting spaces
- A92–810901 23-inches wide, 1 mounting space

To mount the 8106–0X on a panel, remove the back of the unit and disconnect the cable conductors from the circuit board by loosening the retaining screws on the board terminals. This separates the front panel and amplifier from the cable and case. Then reassemble the sections with the panel between them. Consult the schematic diagram to ensure that the cable conductors are reconnected to the correct board terminals; e.g., the blue common wire connects to the terminal marked E1.

5. INSTALLER CONNECTIONS

Installation of the 8106–0X Loudspeaker Set, whether relay-rack or desk mounted, consists of connecting the conductors of the 6- conductor cable to the appropriate equipment. Table 1 provides information necessary to make these connections.

Two inputs to the 8106–0X are provided. The LOW input has an impedance of 600 ohms and should be used with a line which requires a 600-ohm termination. The HIGH input has an impedance of 2400 ohms and should be used to monitor a line which is terminated elsewhere.

The 8106–0X may be disabled by applying ground to the ground disable (GRD DISABLE) conductor.

6. OPTIONS

The 8106–0X is equipped with three screw options. Refer to Figure 2 and the following paragraphs to enable or disable these options.

CAUTION

Do not over tighten when closing a screw option, as damage to the plating of the printed circuit board may result. When opening a screw option, rotate the screw counterclockwise two full turns to ensure that the connection is broken.

Table 1. 8106–0X Installer Connections

Color	Block Diagram Designation	Connect To
Blue	E1 (COMMON)	Common
White	E2 (600 ohm)	Low impedance input
Green	E3 (2400 ohm)	High impedance input
Yellow	E4 (GRD DISABLE)	Ground
Black	E5 (GRD)	Ground
Red	E6 (-Battery)	–24/–48VDC source

6.1 Screw Option SD

The on/off switch (SI) on the volume control may be disabled by closing the SD screw option. In this condition the unit cannot be switched off. To restore operation of the on/off switch turn the screw option two full turns counter-clockwise (open) from the closed position.

6.2 Screw Option MV

The unit may be optioned for minimum volume operation by turning the MV screw option two full turns counter-clockwise from its closed position. In this condition, the volume cannot be reduced to an inaudible level by means of the volume control. To option the unit so that the volume may be reduced to zero, close the MV screw option.

6.3 Screw Option AGC

The AGC circuit may be disabled by turning the AGC screw option two full turns from its closed position. To enable AGC operation, close the AGC screw option.

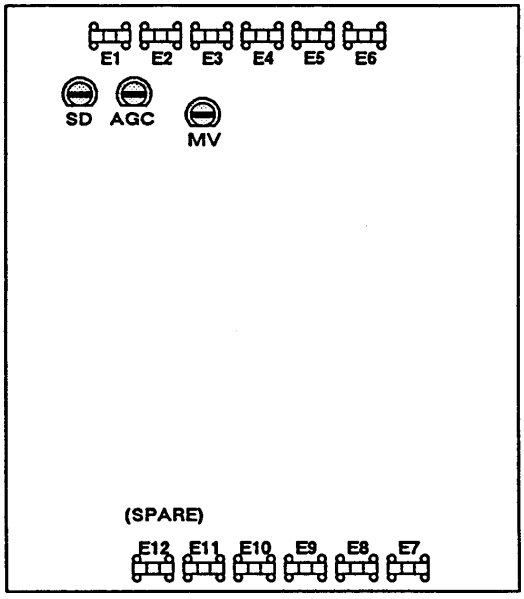

Figure 2. 8106–0X Option and Terminal Locations

7. TESTING

If trouble is encountered with the operation of the unit, verify that all the installer connections have been properly made in accordance with Table 1 and that all options have been conditioned as required.

8. TECHNICAL ASSISTANCE

8.1 Technical Assistance — U.S.

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847–806–8500
847–806–8556 (FAX)
800–607–8500
techserv@charlesindustries.com (e-mail)

8.2 Technical Assistance — Canada

Canadian customers contact:

905–821–7673 (Main Office)
905–821–3280 (FAX)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008–4049
847–806–6300 (Main Office)
847–806–6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an "advanced replacement" service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the preaddressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217–932–5288 (FAX 217–932–2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   – Company name and address
   – Contact name and phone number
   – Inventory of equipment being shipped
   – Particulars as to the nature of the failure
   – Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   CI Service Center
   Route 40 East
   Casey, IL 62420–2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS

The electrical and physical characteristics of the 8106–0X Loudspeaker Set are as follows:

10.1 Electrical

(a) INPUT IMPEDANCE: High input, 2.4 kilohms +/–10 percent; low input, 600 ohms +/–10 percent.

(b) HARMONIC DISTORTION: Less than 2 percent at 1kHz and 0.2 watts output.

(c) FREQUENCY RESPONSE: See Figure 3.

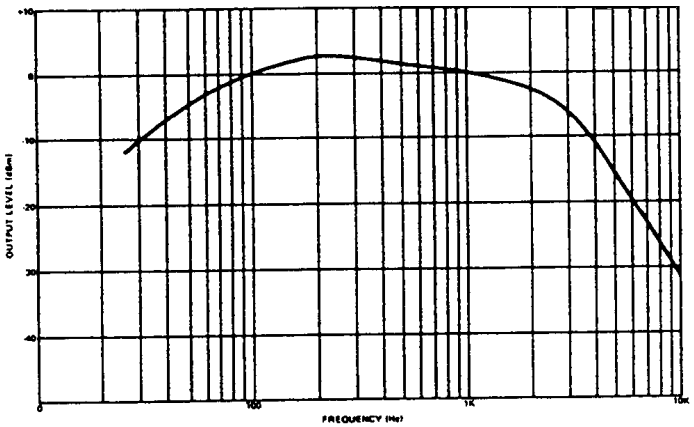

Figure 3. 8106–0X Frequency Response

(d) AGC RESPONSE: See Figure 4.

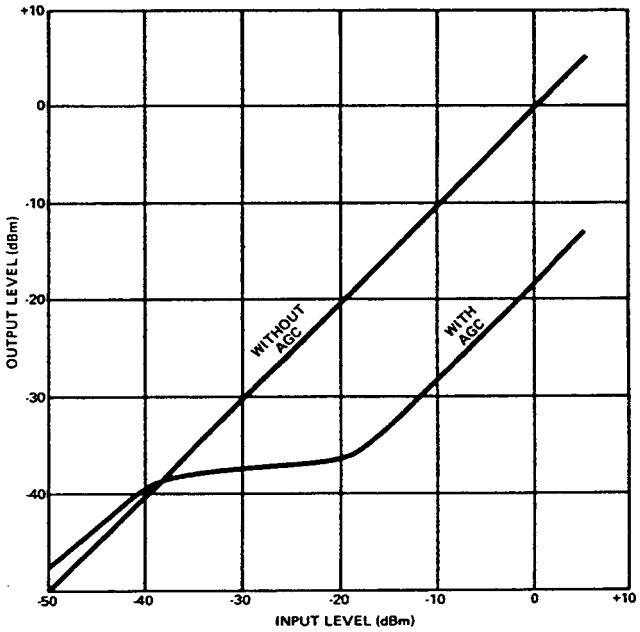

Figure 4. 8106–0X AGC Response

(e) POWER SUPPLY VOLTAGE: –24Vdc nominal (–21VDC minimum, –27VDC maximum); or –48VDC nominal (–44VDC minimum, –56VDC maximum).

(f) POWER SUPPLY CURRENT: –24V input, 175mA maximum; –48V input, 250mA maximum.

(g) INPUT LEVEL RANGE: –40 to +5dBm (600 ohms).

(h) POWER OUTPUT: 0.41 watts minimum (undistorted power) at 1kHz.

(i) ACOUSTIC POWER OUTPUT: 85dB minimum (0dB reference = 10^{-16} watts/ cm^2).

10.2 Physical

See Table 2 for the physical characteristics of the

Table 2. Physical Specifications

Feature	U.S.	Metric
Height (including rubber desk-mount feet)	5.85 inches	14.86 centimeters
Width	5.75 inches	14.60 centimeters
Depth (not including line cord or grommet)	4.90 inches	12.45 centimeters
Weight	4.25 pounds	1.93 kilograms
Temperature	32° to 120°F	0° to 49°C

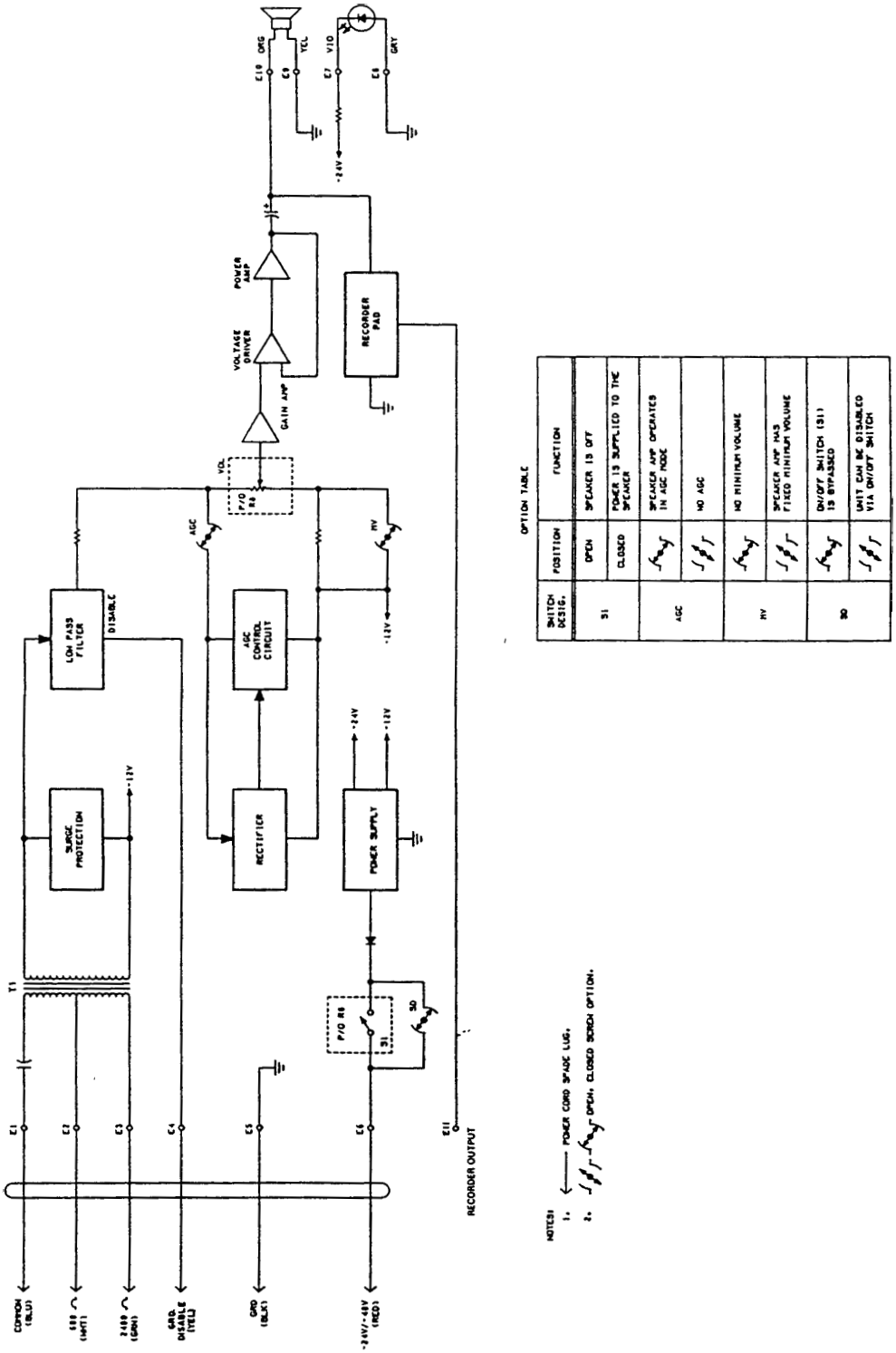

Figure 5. 8106–0X Functional Block Diagram