INSTALLATION INSTRUCTIONS

KP-12 KEYPANEL KITS
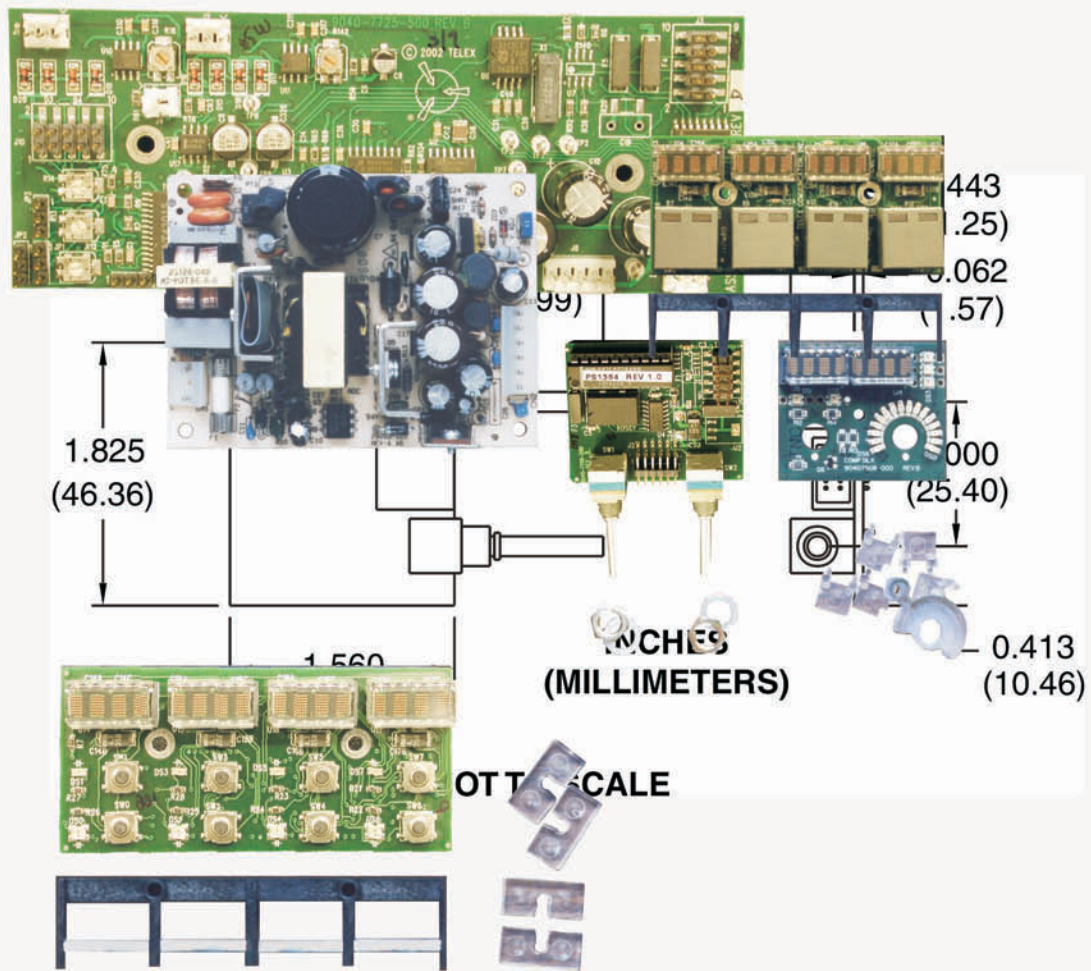
1.825
(46.36)

1.560

443
(.25)

0.062
(.57)

000
(25.40)

0.413
(10.46)

INCHES
(MILLIMETERS)

OT T SCALE

RTS™

UNPACKING AND INSPECTION
Immediately upon receipt of the equipment, inspect the shipping container and the contents carefully for any discrepancies or damage. Should there be any, notify the freight company and dealer at once.

TECHNICAL SUPPORT
Technical questions should be directed to:

> Factory Service Department
> Telex Communications, Incorporated
> West 1st Street
> Blue Earth, MN 56013 U.S.A

RETURN SHIPPING INSTRUCTIONS
Procedure for returns

If a repair is necessary, contact the dealer where the unit was purchased.

If repair through the dealer is not possible, obtain a RETURN AUTHORIZATION from:

> Customer Service Department
> Telex Communications, Inc.
> Telephone: 800-392-3497
> Fax: 800-323-0498

DO NOT RETURN ANY EQUIPMENT DIRECTLY TO THE FACTORY WITHOUT FIRST OBTAINING A RETURN AUTHORIZATION.

Be prepared to provide the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number(s).

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT

All shipments of RTS products should be made via United Parcel Service or the best available shipper, prepaid. The equipment should be shipped in the original packing carton; if that is not available, use any suitable container that is rigid and of adequate size. If a substiture container is used, the equipment should be wrapped in paper and surrounded with at least four incesh of excelsior or similar shock-absorbing material. All shipments must be sent to the following address and must include the Return Authorization.

> Factory Service Department
> Telex Communications, Incorporated
> West 1st Street
> Blue Earth, MN 56013 USA

Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper collect.

End user License

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Contents

1   INTRODUCTION

This manual describes the assembly of custom intercom keypanels using kits based on the RTS™ Systems' KP-12 Intercom Keypanel. Typical applications of these kits could include desktop intercom stations, wall- or panel-mounted intercom stations, rack-mounted intercom stations and hybrid stations that integrate an intercom station into other equipment. The manual contains a brief description of the KP-12 design concept and the general requirements of an intercom station based on this design. Other general design and construction requirements also discussed, such as case materials and additional tools and hardware required to supplement the kits. This is followed by detailed descriptions and specifications, such as dimensions, hole cutout requirements etc., for the various components. Finally, a general procedure is suggested for connecting the components and checking operation. An intercom station constructed using the standard kit components will operate as described in the KP-12 User Instructions which are included with the kits.

2   COMPONENTS OF A KP-12 INTERCOM STATION

Figure 1 shows the main components and their relative positions in a standard KP-12 Keypanel with all options installed. This figure is provided for reference purposes only; custom keypanels can have many different layouts. For example, the KP-12 has 12 intercom keys arranged in a single row; a custom keypanel could have up to 48 keys (if no GPI Module is installed) arranged in several rows. The KP-12 may be optionally equipped with a back panel connector module; a custom keypanel design could use a different arrangement of connectors or eliminate these connectors if they are not required. A gooseneck microphone connector, a speaker, and a headset connector are all provided on the front panel of the KP-12; if a custom keypanel will be used as a headset station only, and space is at a premium, the gooseneck microphone connector and the speaker could be eliminated. In the KP-12, the circuit boards are positioned to permit a rack-mount design only one rack unit high; a custom desktop intercom station may need to occupy less horizontal space. In this situation, one or more circuit boards could be mounted on the sides of the case. Or, the Audio Receive and Audio Transmit boards could be stacked one on top of the other to occupy less space. The following paragraphs provide detailed descriptions of the major components.
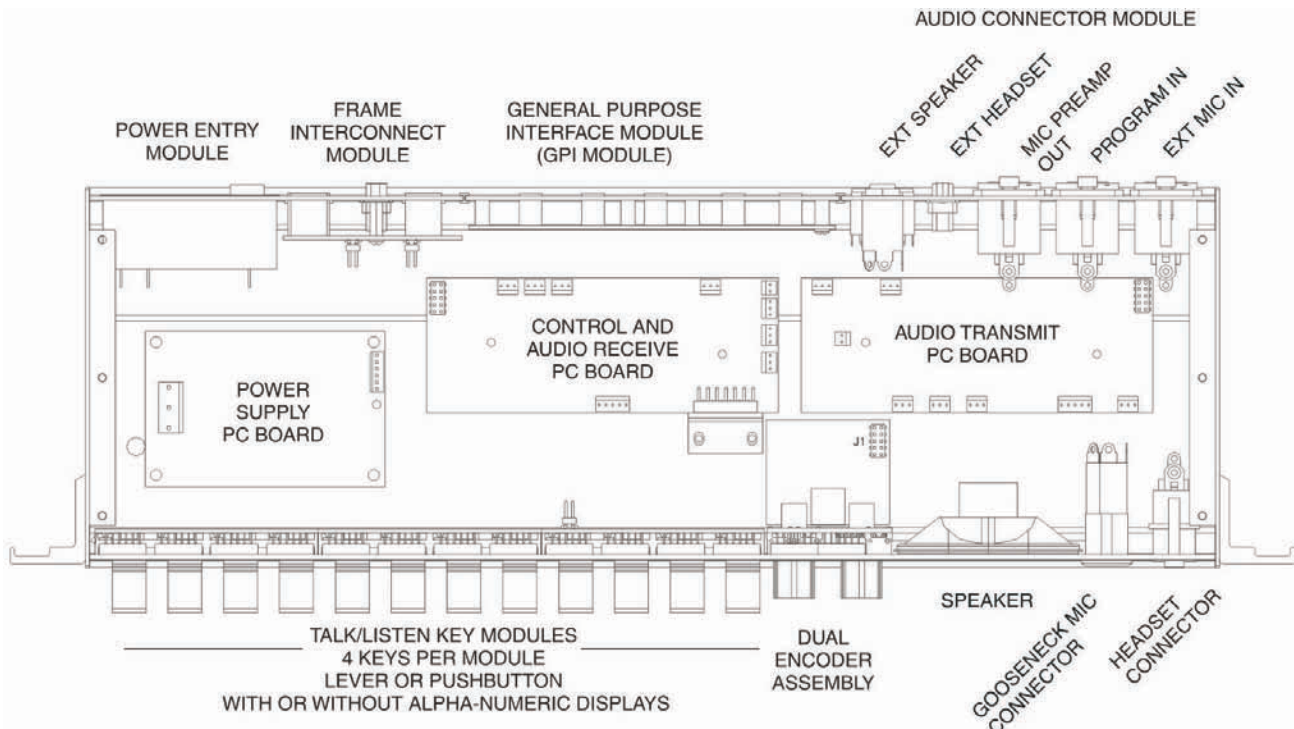

Figure 1. KP-12 Reference View for Typical Layout of Components

2.1   Control and Audio Receive PC Board

This circuit board contains the CPU (central processing unit) for the intercom station. It also contains the EPROM (eraseable programmable read-only memory) which defines the keypanel operation and RAM (random access memory) which stores the current configuration information for the keypanel, including the current key assignments and the keypanel's current address within the intercom system. The Control and Audio Receive circuit board also contains two serial control interfaces. One is an RS-485 interface for communication with the intercom system. The other interface is an I^{2}C communication system, which uses a common bus (in this case, a ribbon cable) to exchange control information between the CPU and the other devices within the intercom station itself. In the I^{2}C system, each device has a unique address, and all control information that is sent and received by the devices is coded with this address to assure that it arrives at the correct location. Table 1 summarizes how I^{2}C devices are allocated within the keypanel. The I^{2}C bus has a limit of 15 devices. This limit only becomes an issue when a large number of Key Modules are connected. For example, a fully optioned keypanel (includes a GPI module). is limited to 44 talk/listen keys (11 Key Modules, with 4 keys per module).
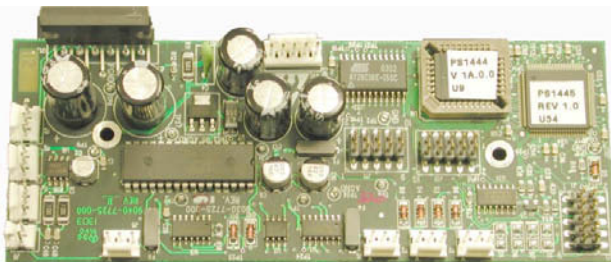

Figure 2. Control and Audio Receive PC Board

Table 1. I^{2}C Device Allocation

Circuit Board or Module	Number of I^{2}C Devices
Control and Audio Receive PC Board	1
Audio Transmit PC Board	1
Dual Encoder Assembly	1
General Purpose Interface (GPI) Module	1
Talk/Listen Key Module (four keys per module)	1
Fram Interconnect Module	1

The Control and Audio Receive PC board also contains all audio circuitry required for a listen-only intercom station. This includes a balanced intercom channel audio input, a balanced program input (to monitor a local audio source only) a 24-watt speaker amplifier, and a headphone amplifier. the speaker amplifier can drive an internal loudspeaker, as well as an optional speaker output at the back panel.

2.2   Audio Transmit PC Board

The Audio Transmit PC Board adds talk-back capability to the intercom station. It contains the following:

- an electret mic input
- two balanced, dynamic-mic inputs
- a balanced, unswitched mic pre-amp output (hot mic)
- a balanced intercom audio output
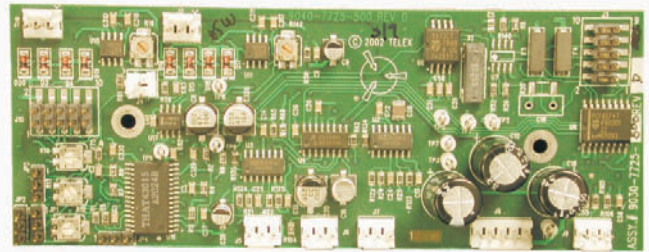- a tone generator
- a sidetone output

Figure 3. Audio Transmit PC Board

The mic inputs provide the flexibility of using either electret or dynamic type microphones. The mic pre-amp output is a "hot mic" signal that can be sent to other equipment. This allows the station operator to use a common microphone to talk to multiple audio systems. The balanced intercom audio output sends the signal from the currently selected mic input to the intercom matrix. The tone generator can be used to check the audio path from the keypanel to the intercom matrix and back. The sidetone circuit feeds a portion of the microphone signal back into the audio receive circuits on the Control and Audio Receive Board. In this way, the station operator can hear his or her own voice in the headphones when using a headset.

The I^{2}C device on the Audio Transmit board consists of electronic switches by which the CPU selects the desired mic source and turns the tone generator on or off. This I^{2}C device is simply a passive recipient of control information. It does not send any control signals back to the CPU. The

Audio Transmit PC Board also contains a balanced intercom line driver which sends the currently selected mic signal, and the tone generator output, if active, back to the intercom system.

2.3 Dual Shaft Encoder and Dual Display PC Boards

The Dual Shaft Encoder PC Board assembles to the Display PC Board. The two assembled boards provide the following capabilities:

- access to the keypanel's menu-driven program ming system
- independent volume adjustment for speaker output, headphone output, and the auxilliary program audio input
- caller identification for incoming calls, with talkback capability
- access to the telephone support features ncluding manual dialing, auto-dialing and redialing. (Requires an optional TIF-2000 Telephone Interface)

The Dual Shaft Encoder Board contains two, multi-position rotating shaft encoder switches. Each shaft encoder also has momentary push-button contacts. The Display Board contains two, four-character alpha-numeric displays, five status LEDs, and a 16-segment LED volume display. The Display Board plugs into the shaft encoder board and is secured by washers and nuts on the shaft encoders. There are five small light pipes for LEDs and a larger light pipe for the volume display. The entire assembly is designed for mounting through the front panel of the intercom station. The volume display light pipe provides the spacing between the assembled boards and the intercom case. With .080-inch
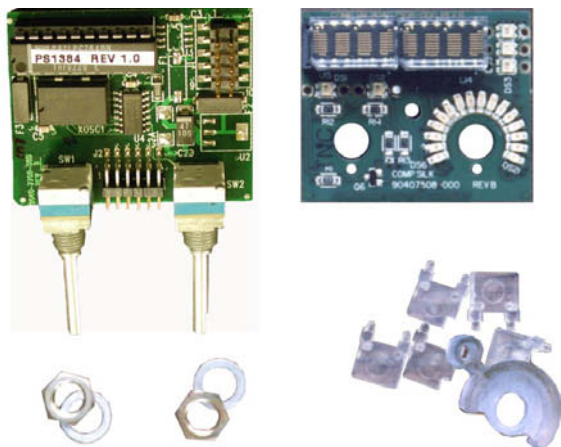
thick (2.03mm) panel material, this spacing will cause the front surface of the alpha-numeric displays to be just behind the front surface of the front panel.

Refer to the KP-12 User Manual for information about the operation of the shaft encoders.

2.4 Key Modules

Each key module provides four, talk/listen keys, with a choice of pushbutton or lever keys, with and without four-character, alpha-numeric displays. Each key module is supplied with a plastic support that provides spacing behind the front panel. With .080-inch thick (2.03mm) panel material, this spacing will cause the front surface of the alpha-numeric displays to be positioned just behind the front surface of the front panel. Refer to the KP-12 User Manual for information about the operation ofthe keys and displays.
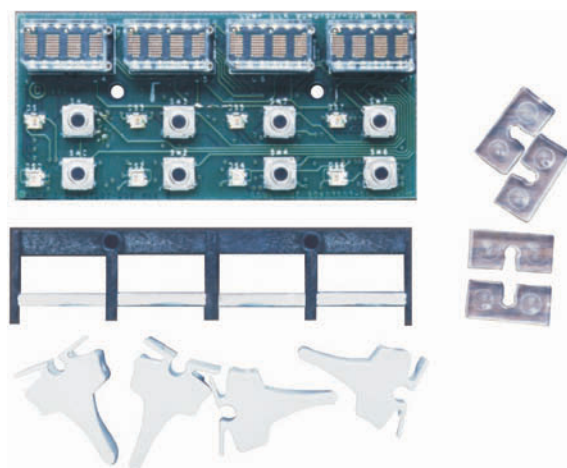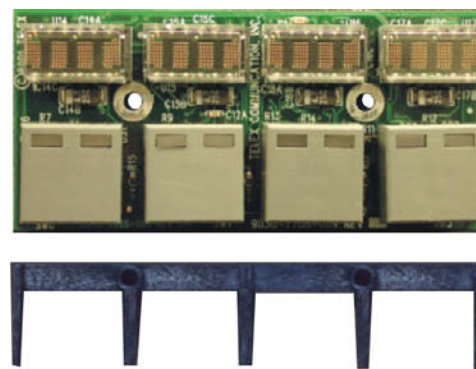

Figure 5. Lever Key Module Components

Figure 4. Dual Shaft Encoder and Dual Display PC Boards

Figure 6. Pushbutton Key Module Components

2.5 General Purpose Interface Module (GPI)

The GPI Board provides a means of controlling external devices from the keypanel and of controlling the keypanel from external devices. The GPI Module contains the following:

- two DPDT relays, each with two available pairs of normal-open, normal-closed and common contacts
- two open collector outputs capable of directly driving TTL or CMOS inputs
- four opto-isolated inputs capable of being driven by TTL or CMOS devices
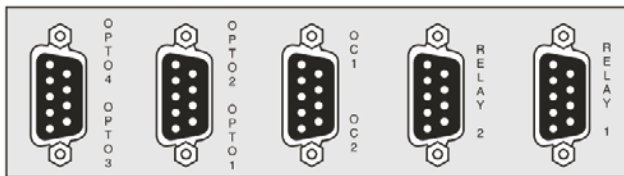

Figure 7. GPI Module

2.6 Connector Module

The connector module provides:

- An external dynamic-mic input
- An external line input for connection of a local audio source
- A mic preamp output connector which can be turned off via the dual shaft encoder
- A connector for an external dynamic-mic headset. This connector may also be used with an external electret mic when a front panel speaker or an external speaker is being used.
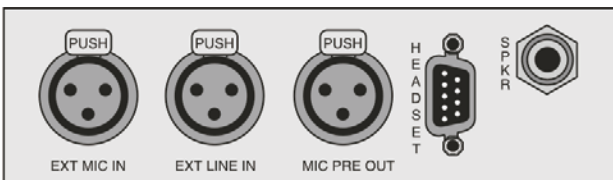
Figure 8. Connector Module

2.7 Power Entry Module

The power entry module provides a universal power cord connector, fuse, and on/off switch.

2.8 Frame Interconnect Module

The Frame Interconnect Module provides intercom system connectors. There is also an expansion connector for connection of an EKP-Series expansion panel.

2.9 Power Supply PC Board

This versatile, switching type power supply is suitable for
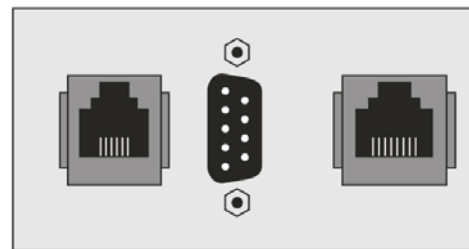
Figure 10. Frame Interconnect Module

use with AC input voltages from 47 to 260 VAC and 47 to 63Hz. The power supply has enough rated capacity to power all of the base circuitry plus a few extra modules. For example, if a GPI module is not used, up to 6 key modules (24 talk/listen keys) may be installed. If more key modules are required, a suitable power supply providing the same output voltages, but with higher capacity, will have to be substituted.
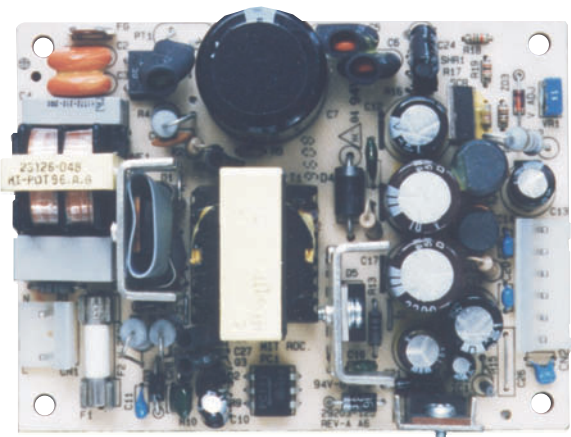
Figure 9. Power Supply PC Board

2.9.1   Power Supply Specifications

AC Input Voltage: 90 to 260 VAC

AC Frequency: 47 to 63 Hz

AC Input Current (RMS): 0.8 A at 115 VAC; 0.4 A at 230 VAC

DC Outputs: See Table 2

Efficiency: 70% typical at full load

Hold-up Time: 16 msec typical at full load and 115 VAC input

Overcurrent Protection: All outputs equipped with automatic recovery current limiting circuit

Overvoltage Protection: 5.6 V to 6.5 V on main output

Table 2. Power Supply Ratings (Any substituted supply must meet or exceed the ratings for Ripple and Total Tolerance)

Output Voltage	Load				Ripple (P-P)	Total Tolerance	Output Pins
	Min	Max	@20 CFM	Peak			
+5.1V	0.3A	2.0 A	4.0 A	5.0 A	50mV	±2%	2,3
+12 V	0.1 A	1.0 A	1.5 A	2.0 A	120 mV	±5%	1
-12 V	0.0 A	0.3 A	0.3 A	0.5 A	120 mV	± 5%	6

Table 3. Module Maximum Current Requirements

Module	+5.1 VDC	+12 VDC	-12 VDC
Control and Audio Receive	80 mA	145 mA	80 mA
Audio Transmit	6 mA	25 mA	45 mA
Dual Encoder and Dual Display	175 mA	0 mA	0 mA
Key Modules	305 mA	0 mA	0 mA
GPI Modules	250 mA	0 mA	0 mA
Frame Interconnect	3 mA	0 mA	0 mA

3   KIT PARTS LISTS

3.1   KP12-SP Intercom Station Kit with 12 Alpha-Numeric Pushbutton Keys

Kit Part Number 9000-7497-003

This kit contains the basic componenets for an intercom station with 12 pushbutton style intercom keys. Items not supplied: case, component mounting hardware, and matrix interconnect cables.

Quantity	Description	Part Number
1	KPM-BASE-S Base Component Kit (Includes installation instructions)	9010-7497-010
3	KPM-P4A Pushbutton Kit, 4 Pushbuttons with Alpha-Numeric Displays	9010-7497-005
1	KP-12 User Instructions, Pushbutton Version (Rev E or later)	9350-7497-001

3.2   KP12-SL Intercom Station Kit with 12 Alpha-Numeric Lever Keys

Kit Part Number 9000-7497-004

This kit contains the basic components for an intercom station with 12 lever style intercom keys. Items not supplied: case, component mounting hardware, and matrix interconnect cables.

Quantity	Description	Part Number
1	KPM-BASE-S Base Component Kit (Includes installation instructions)	9010-7497-010
3	KPM-L4A Lever Key Kit, 4 Lever Keys with Alpha-Numeric Displays	9010-7497-006
1	KP-12 User Instructions, Lever Key Version (Rev B or later)	9350-7497-002

3.3 KPM-BASE-S Base Component Kit

Part Number 9000-7497-010

This kit contains the basic components for an intercom station. Pushbutton or lever key kits are required to complete the intercom station. Items not supplied: case, component mounting hardware, and matrix interconnect cables.

Quantity	Description	Part Number
1	PC Board Assembly, Control and Audio Receive	9030-7725-000
1	PC Board Assembly, Audio Transmit	9030-7725-500
1	PC Board Assembly, Matrix Frame Interconnect	9030-7506-000
1	PC Board Assembly, Power Supply	532024-000
1	PC Board Assembly, Dual Display	9030-7508-000
1	PC Board Assembly, Dual Encoder	9030-7709-500
1	Light Pipe, Volume Indicator for Dual Encoder	700501-000
5	Light Pipe, Call, Menu, Hdst, Spkr, Prgm Indicators for Dual Encoder	700502-000
2	Knob, Select and Volume for Dual Encoder	590218-000
1	Speaker and Wire Connector Assembly	800169-000
1	Bushing, Gooseneck Mic Connector	9160-7028-001
1	Bushing, Gooseneck Mic Connector	700678-000
1	Lock Washer, Gooseneck Mic Connector Mounting	585025-000
1	Nut, 5/8 - 18, Gooseneck Mick Connector Mounting	585016-000
1	Gooseneck Mic Jack and Wire Connector Assembly	800162-000
1	Headset XLR4RF Panel Mount Connector and Wire Connector Assembly	800163-000
1	Cable, Ribbon, 5ft. (1.5 m), I²C Bus Signal and Power Distribution	57799-001
5	I²C Ribbon Cable Connector, 10 Pin	57739-001
1	Cable Assembly, Frame Interconnect to Audio Receive and Transmit Boards	800166-000
1	Cable Assembly, Audio Receive and Transmit Board Power Distribution	800167-010
1	Cable Assembly, Sidetone	800212-000
1	KP-12 Custom Keypanel Kit Instructions	9330-7497-003
1	Cable, Ribbon, 6 inches (digital control for compression)	800168-003

3.4 KPM-P4 Pushbutton Kit, 4 Pushbuttons without Displays

Kit Part Number 9000-7497-011

This kit is intended for used with the KPM-BASE-S Kit. Each pushbutton kit adds 4 pushbutton intercom keys. Also order one copy of KP-12 User Instructions, Pushbutton Version (specify Rev E or later) part number 9350-7497-0001.

Quantity	Description	Part Number
1	PC Board Assembly, 4 Pushbutton, No Display	9030-7708-014
1	PC Board Support, Pushbutton	9110-7497-000
2	Nut, 4-40	50033-022
1	I²C Ribbon Cable Connector, 10 Pin	57739-001

3.5   KPM-P4A Pushbutton Kit, 4 Pushbuttons with Alpha-Numeric Displays

Kit Part Number 9000-7497-005

This kit is intended for use with the KPM-BASE-S Kit. Each pushbutton kit adds 4 pushbutton intercom keys. Also, order one copy of KP-12 User Instructions, Pushbutton Version (specify Rev E or later) part number 9350-7497-001.

Quantity	Description	Part Number
1	PC Board Assembly, 4 Pushbuttons, 4 Alpha-Numeric Displays	9030-7708-004
1	PC Board Support, Pushbutton	9110-7497-000
2	Nut, 4-40	50033-022
1	I^2C Ribbon Cable Connector, 10 Pin	57739-001

3.6   KPM-L4 Lever Key Kit, 4 Lever Keys without Displays

Kit Part Number 9000-7497-012

This kit is intended for use with the KPM-BASE-S Kit. Each lever key kit adds 4 intercom keys. Also order one copy of the KP-12 User Instructions, Lever Key Version (specify Rev B or later) part number 9350-7497-002.

Quantity	Description	Part Number
1	PC Board Assembly, 4 Pushbuttons, No Display	9030-7708-018
1	PC Board Support with Pin, Lever Key	9110-7497-001
2	Nut, 4-40	50033-022
1	I2C Ribbon Cable Connector, 10 Pin	57739-001
4	Lever Key	700504-000
4	Light Pipe, Lever Key	700499-000

3.7   KPM-L4A Lever Key Kit, 4 Lever Keys with Alpha-Numeric Displays

Kit Part Number 9000-7497-006

This kit is intended for use with the KPM-BASE-S Kit. Each lever key kit adds 4 intercom keys. Also order one copy of KP-12 User Instructions, Lever Key Version (specify Rev B or later) part number 9350-7497-002.

Quantity	Description	Part Number
1	PC Board Assembly, 4 Lever Key, 4 Alpha-Numeric Display	9030-7708-008
1	PC Board Support with Pin, Lever Key	9110-7497-001
2	Nut, 4-40	50033-022
1	I^2C Ribbon Cable Connector, 10 pin	57739-001
4	Lever Key	700504-000
4	Light Pipe, Lever Key	700499-000

3.8   KPM-IO General Purpose Input/Output (GPI) Module Kit

Kit Part Number 9000-7497-022

NOTE: This kit should not be ordered for use on a factory-built KP-12, since it is not equipped with the required mounting plate and spacers.

Quantity	Description	Part Number
1	BPI Assembly, 4 Relays, 2 Open Collector Outputs, 4 Opto-Isolator Inputs	9020-7505-000
1	I2C Ribbon Cable Connector, 10 pin	57739-001

3.9   KPM-CK Audio Connector Kit

Kit Part Number 9000-7497-023

This kit contains pre-wired connector assemblies for external connection of microphone, speaker, program input, unswitched balanced mic preamp output, and dynamic-mic headset. This kit should not be ordered for use on a factory-built KP-12, since it is not equipped with the required mounting plate and spacers.

Quantity	Description	Part Number
1	Connector Panel Assembly, with 3-Conductor 1/4-inch Phone Jack (Speaker), DE9P Connector (Headset), and 3 XLR3F Audio Connectors (Mic Preamp Out, Program In., Ext. Mic. In.). Includes Wire Connectors to PC Boards	9020-7497-002

14

4   Dimensions and Cutouts

5.200
(132.08)

3.421
(86.89)

0.218
(5.54)

2.000
(50.80)

1.045
(50.80)

0.871
(22.12)

.125 DIA.
(3.17 DIA.)

0.953
(24.21)

0.062
(1.57)
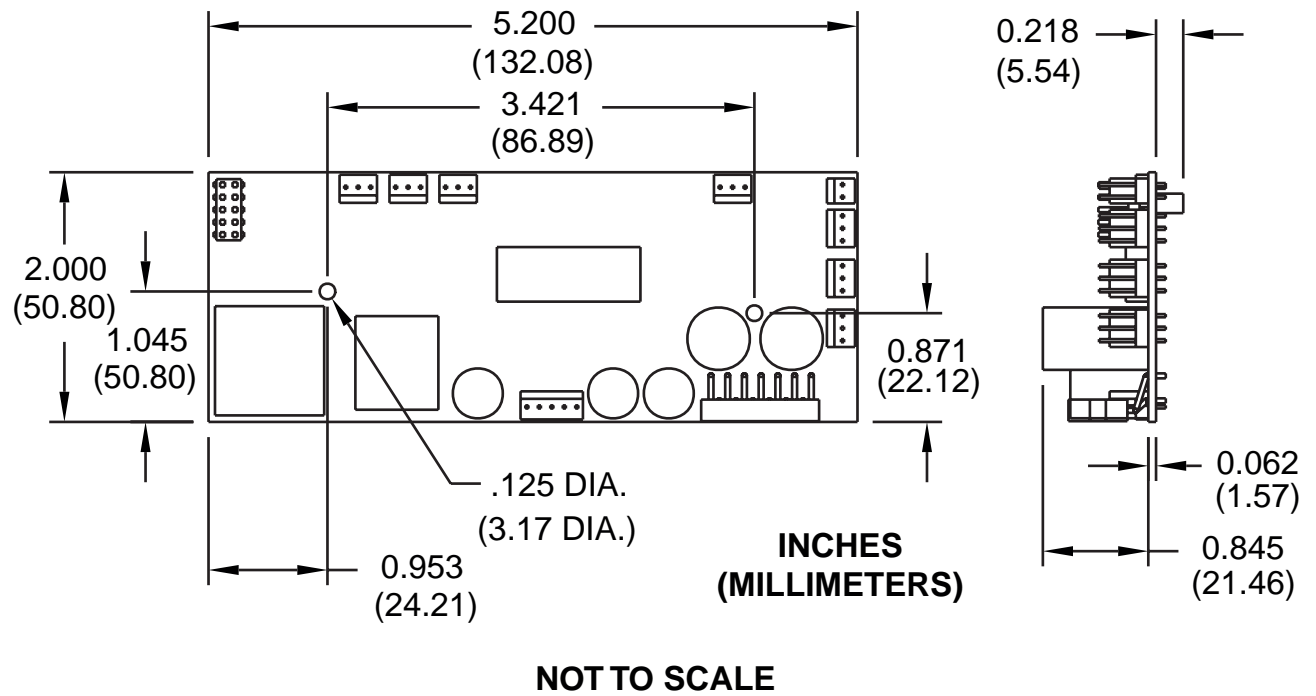
0.845
(21.46)

**INCHES
(MILLIMETERS)**

NOT TO SCALE

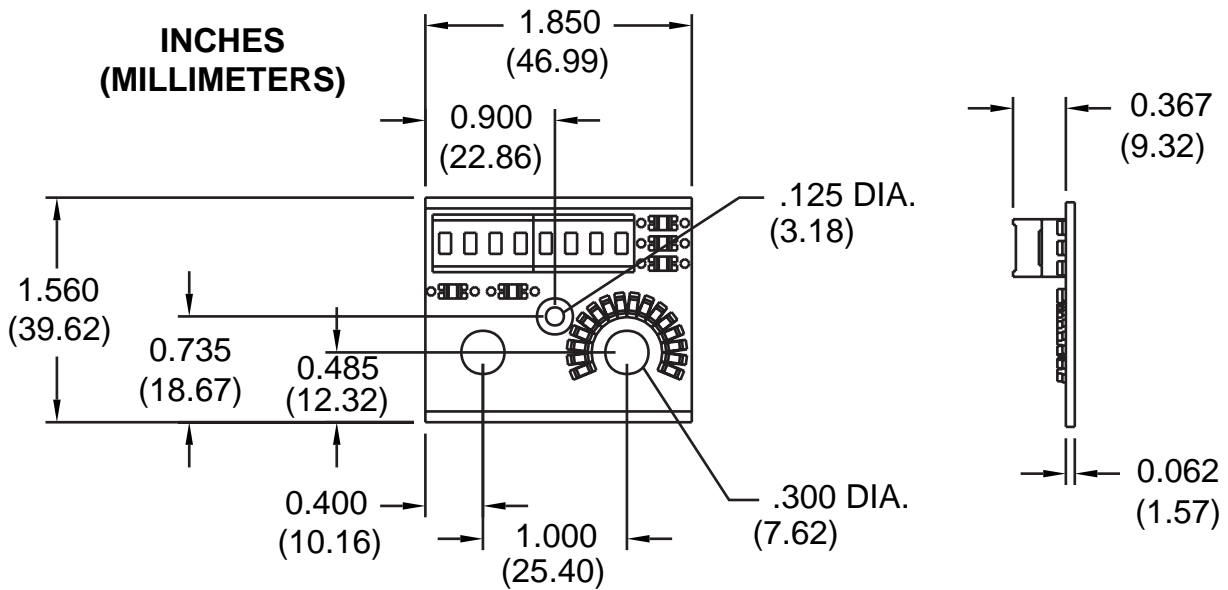*Figure 11. Control and Audio Receive PC Board Dimensions (Not shown to scale)*

5.200
(132.08)

0.953
(24.21)

0.830
(21.08)

2.000
(50.80)

1.045
(26.54)

0.871
(22.12)

.125 DIA.
(3.18)

3.421
(86.89)

BETWEEN MOUNTING
HOLE CENTERS

**INCHES
(MILLIMETERS)**
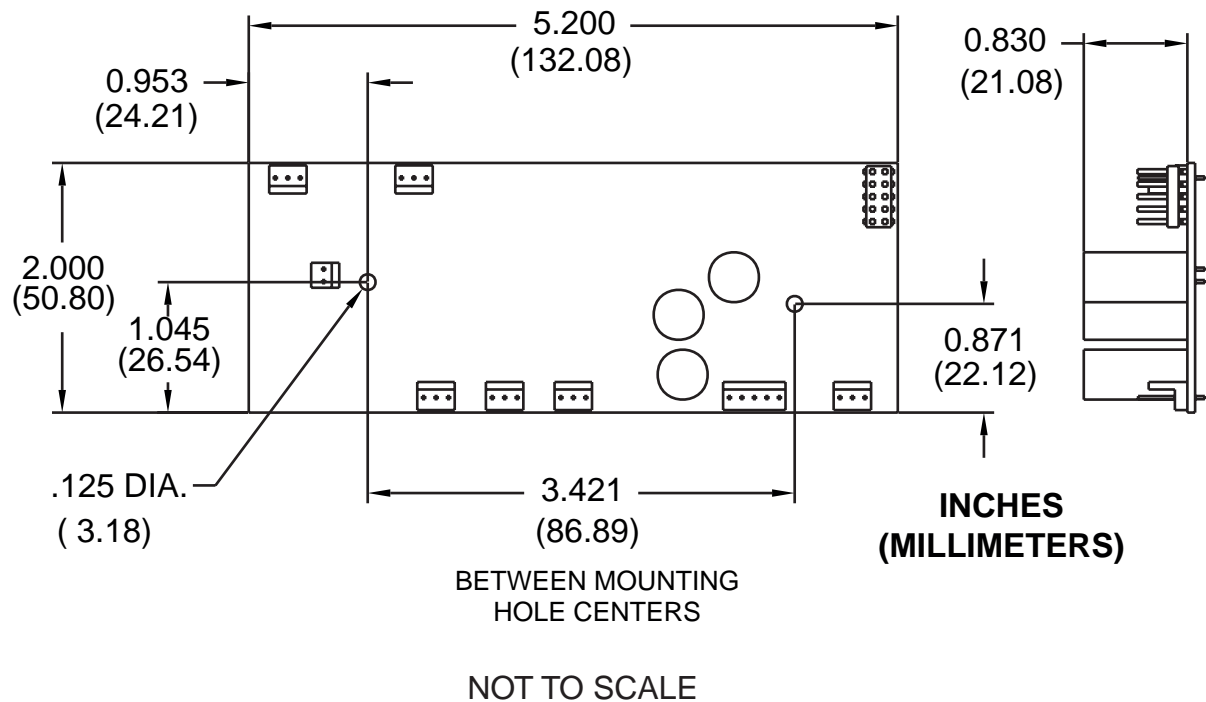
NOT TO SCALE

Figure 12. Audio Transmit PC Board Dimensions (Not shown to scale)

2.594
(65.89)

0.984
(24.99)

0.443
(11.25)

0.062
(1.57)

1.825
(46.36)

1.000
(25.40)

**INCHES
(MILLIMETERS)**

1.560
(39.62)

0.413
(10.46)
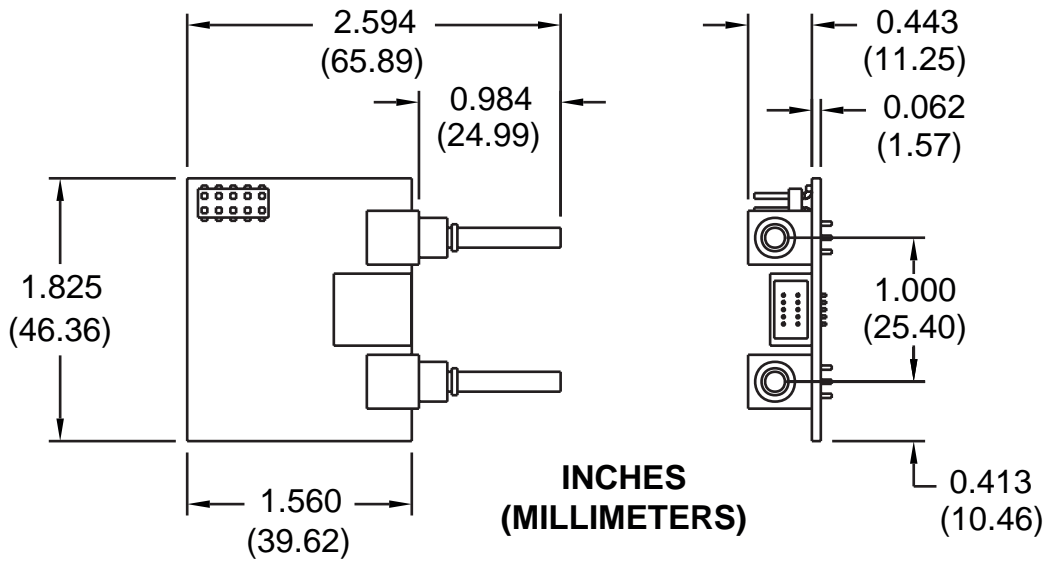
NOT TO SCALE

Figure 13. Dual Shaft Encoder PC Board Dimensions (not to scale)

**INCHES
(MILLIMETERS)**

1.850
(46.99)

0.900
(22.86)

.125 DIA.
(3.18)

0.367
(9.32)

1.560
(39.62)

0.735
(18.67)

0.485
(12.32)

0.400
(10.16)

1.000
(25.40)

.300 DIA.
(7.62)

0.062
(1.57)

NOT TO SCALE

Figure 14. Dual Display PC Board Dimensions (not to scale)

INCHES
(MILLIMETERS).

DISPLAY BOARD OUTLINE

.392 R.
(9.96)

.292 R.
(7.42)

1.560
(39.63)

0.485
(12.32)

68°

0.450
(11.43)

.050 R.
(1.27)

1.850
(46.99)

1.800
(45.72)

0.500
(12.70)

1.000
(25.40)

0.815
(20.70)

.125 DIA.
(3.18)

0.358
(9.09)

0.408
(10.36)

0.488
(12.40)

0.557
(14.15)

.270 DIA.
(6.86)

0.957
(24.31)
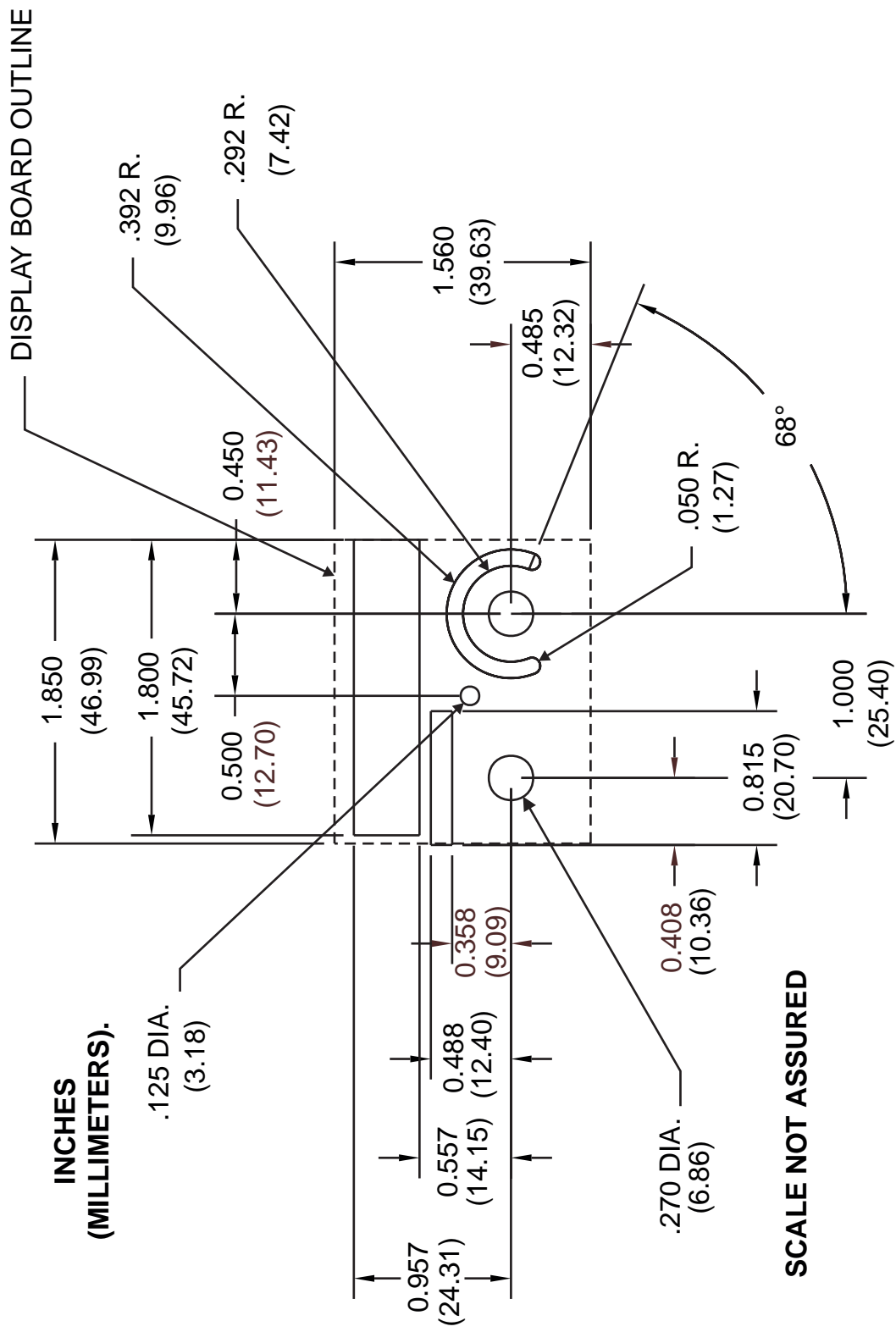
SCALE NOT ASSURED

Figure 15. Cutout Dimensions for the Dual Display PC Board (scale not assured)

17

INCHES
(MM)

3.304
(83.92)

0.826
(20.98)

1.652
(41.97)

1.560
(39.62)

0.909
(23.09)

.125 DIA.
(3.18)

.250 MAX. DIA. STAND-OFF
(6.35)

0.367
(9.32)

0.062
(1.57)

0.138
(3.51)

0.400
(10.16)

3.294
(83.67)

0.821
(20.85)

1.652
(41.96)

NOT TO SCALE

0.320
(8.13)

0.755
(19.18)

0.170
(4.32)

0.104
(2.64)
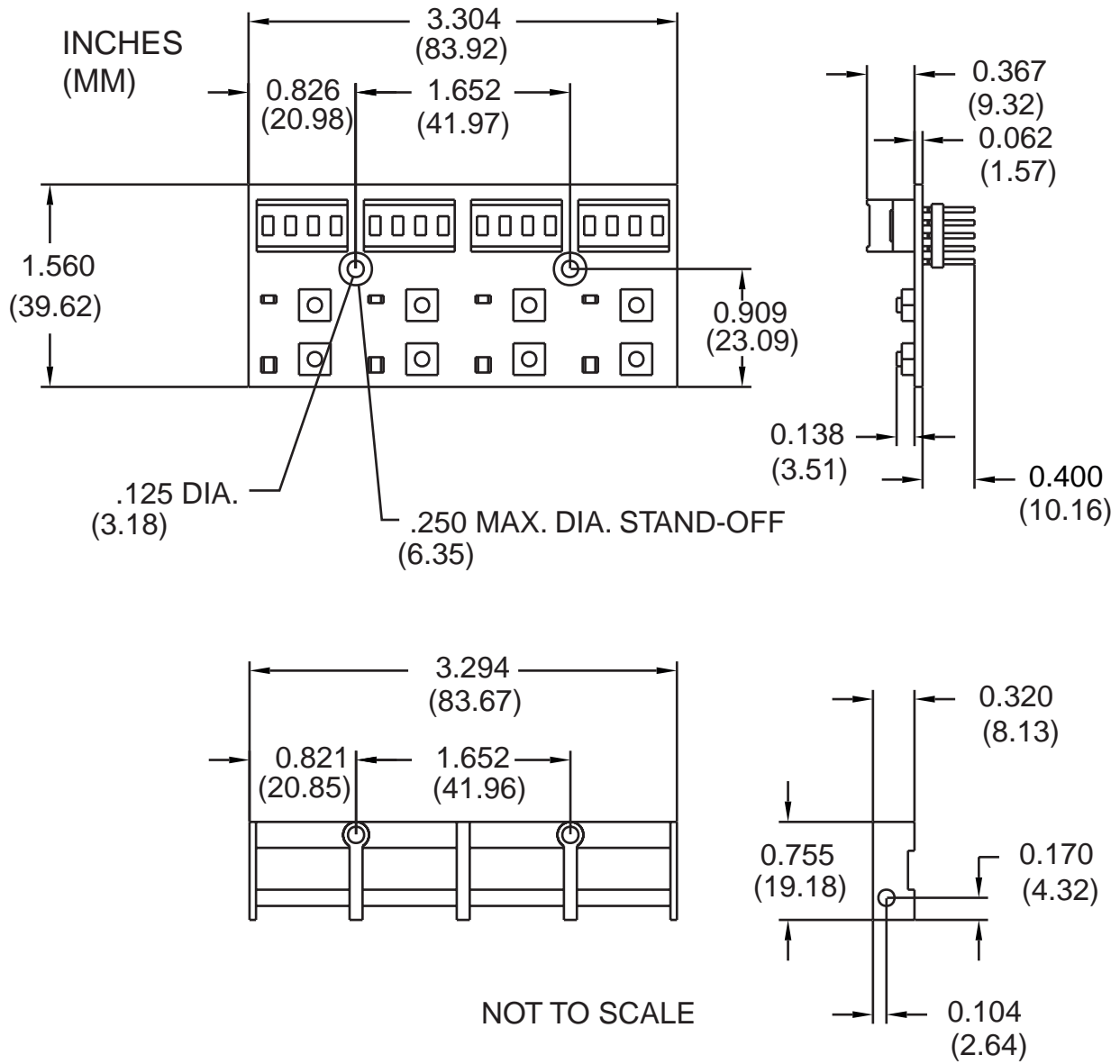
Figure 16. Lever Key PC Board Dimensions (not to scale)

3.304
(83.92)

0.826
(20.98)

1.652
(41.97)

1.560
(39.62)

0.909
(23.08)

.125 DIA.
(3.18)

.250 MAX DIA. STAND-OFF
(6.35)

0.590
(14.99)

0.366
(9.32)

0.062
(1.57)

0.400
(10.16)

3.294
(83.67)

0.821
(20.85)

1.652
(41.96)

0.320
(8.13)

0.755
(19.18)
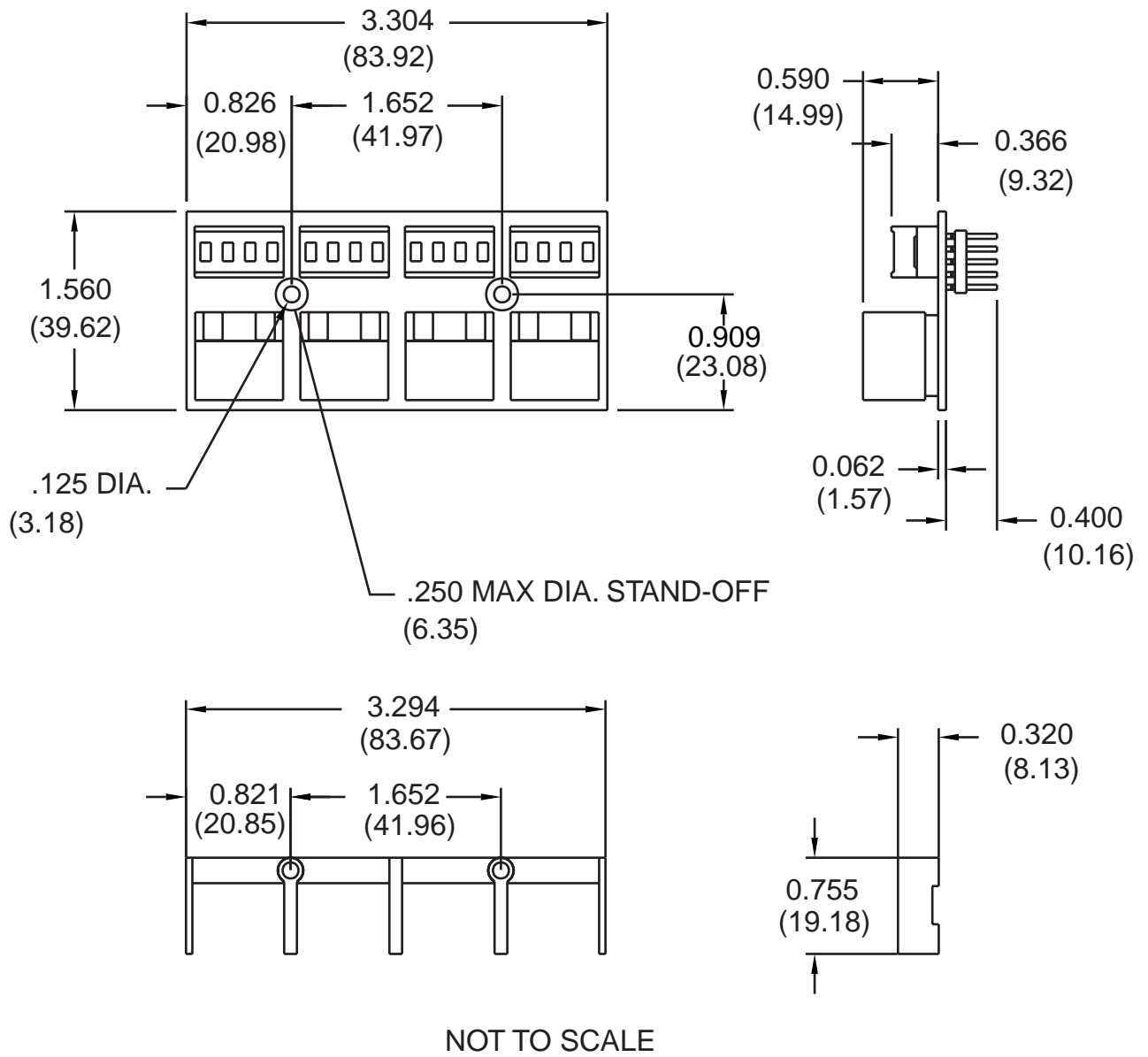
NOT TO SCALE

Figure 17. Pushbutton Key PC Board Dimensions (not to scale)

.706 X .400 CUT OUT
(17.93 X 10.16)
(4 PLS)

.113 DIA.
(2.87)

0.336
(8.53)

0.487
(12.37)

.706 SQ. CUT OUT
(17.93 SQ.)
(4 PLS)

SCALE NOT ASSURED

INCHES
(MM)

0.826
(20.98)
(TYP)

0.400
(10.16)

1.652
(41.96)

3.304
(83.92)

0.826
(20.98)

INDICATES BOARD
OUTLINE

0.651
(16.53)

1.560
(39.62)
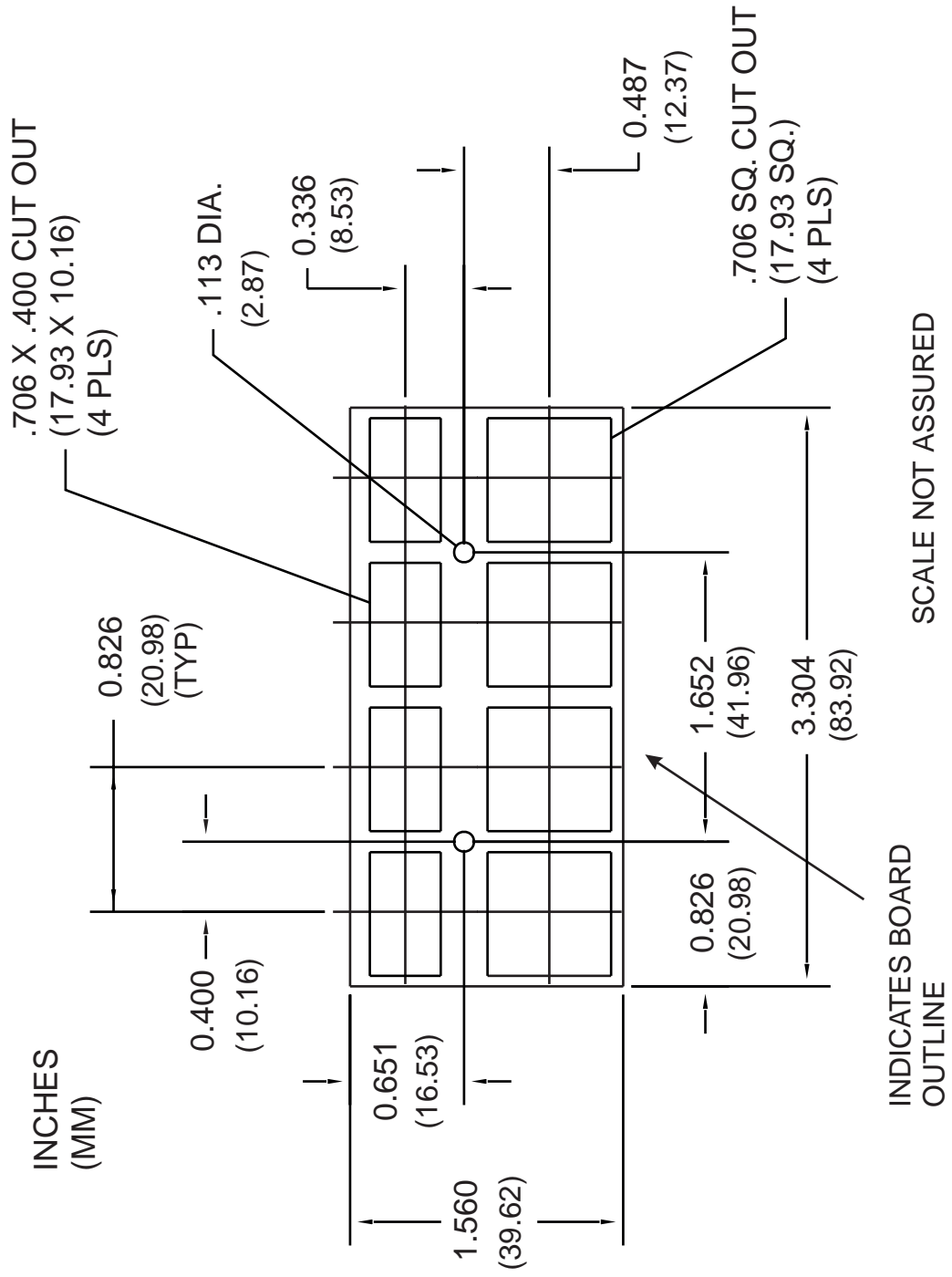
Figure 18. Panel Cutout Dimensions for Lever Key PC Board and Pushbutton PC Board (scale not assured)

INDICATES BOARD OUTLINE

1.652 MIN. (41.96)

1.660 MIN. (42.16)
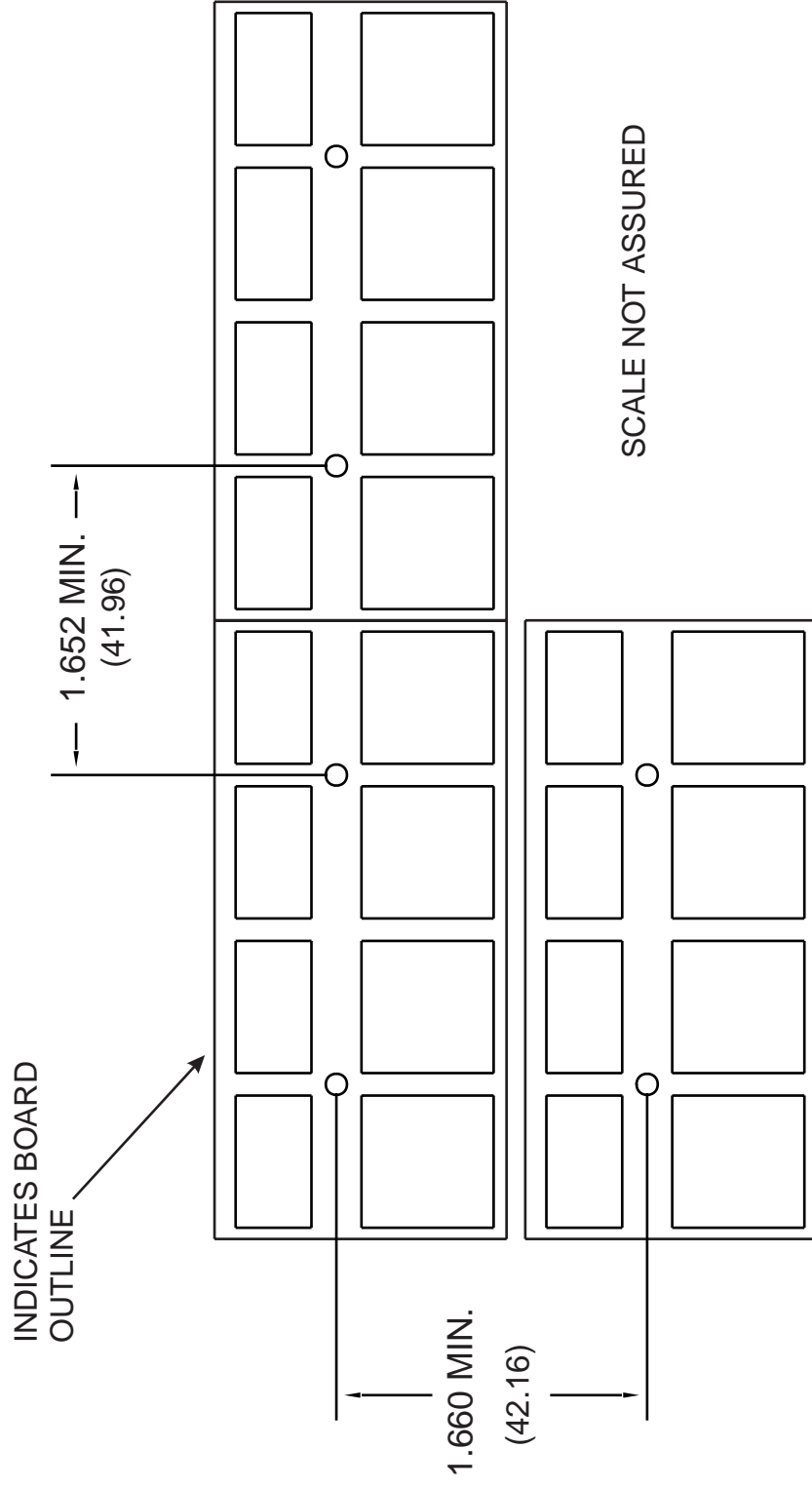
SCALE NOT ASSURED

Figure 19. Minimum Hole Spacing Requirement for Side by Side and Above/Below Key Board Placement (Scale not assured)

INCHES
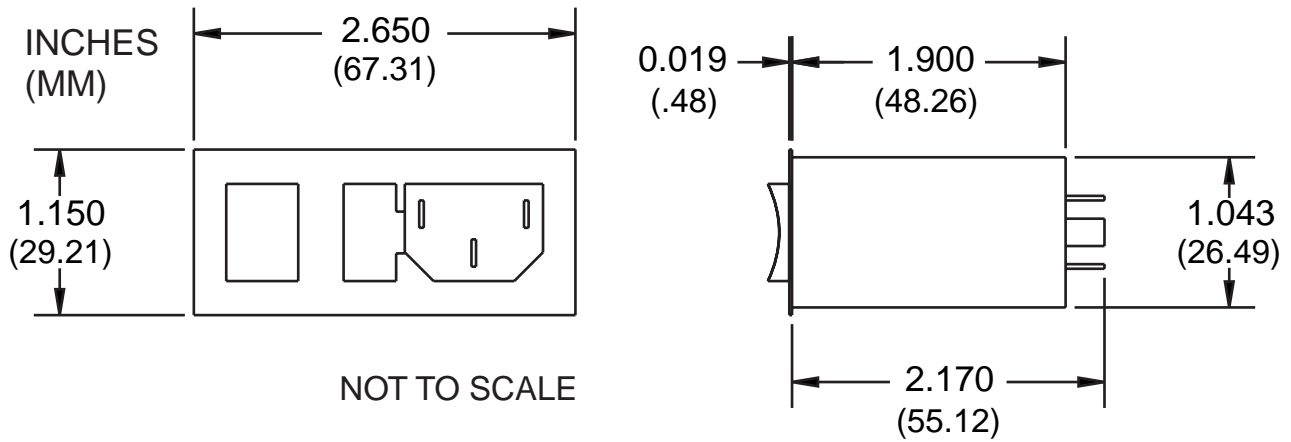(MM)

2.650
(67.31)

1.150
(29.21)

NOT TO SCALE

0.019
(.48)

1.900
(48.26)

1.043
(26.49)

2.170
(55.12)

Figure 20. Power Entry Module Dimensions (not to scale)

2.600
(66.04)

INCHES
(MM)

1.063
(27.00)
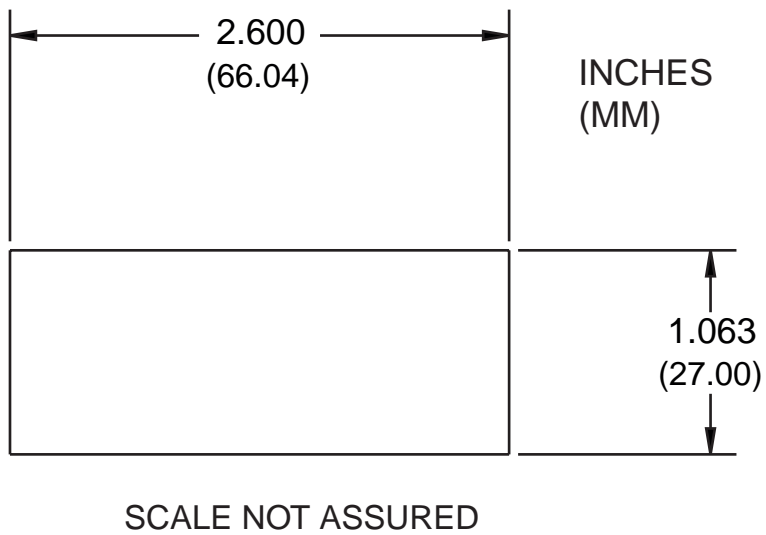
SCALE NOT ASSURED

Figure 21. Power Entry Module Panel Cutout Dimensions (scale not assured)

INCHES
(MILLIMETERS)

3.000
(76.20)

4.000
(101.60)

3.600
(91.60)

.160 DIA.
(4.06)

0.200
(5.08)

2.600
(66.04)

0.200
(5.08)

1.300
(33.02)
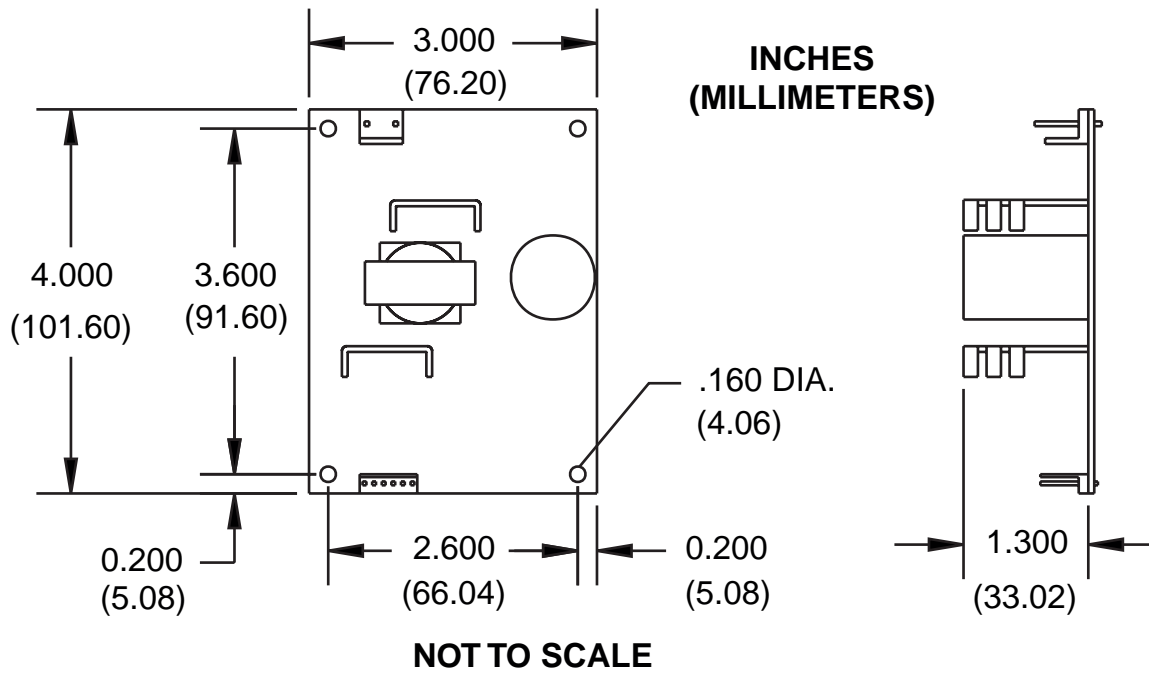
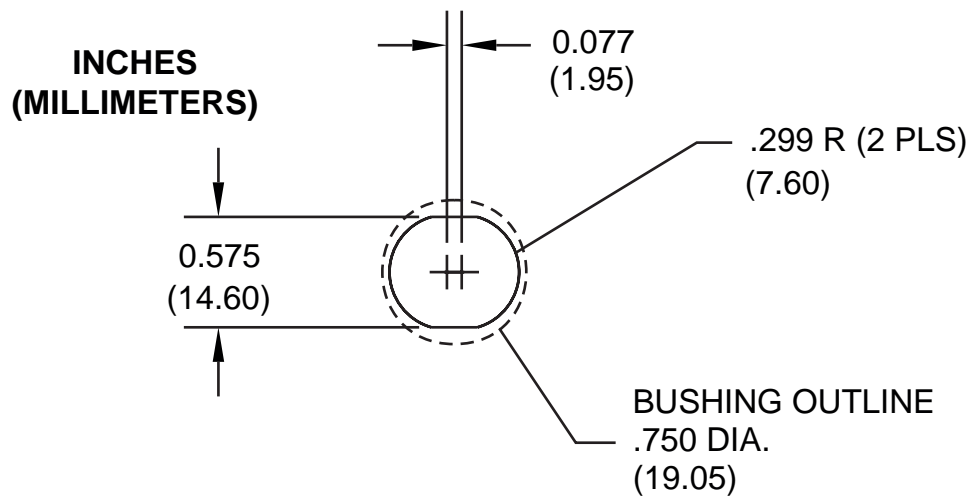NOT TO SCALE

Figure 22. Power Supply PC Board Dimensions (not to scale)

2.650
(67.31)

1.400
(35.56)

0.530
(13.47)

1.272
(32.30)

INCHES
(MILLIMETERS)

0.062
(1.57)

0.400
(10.16)
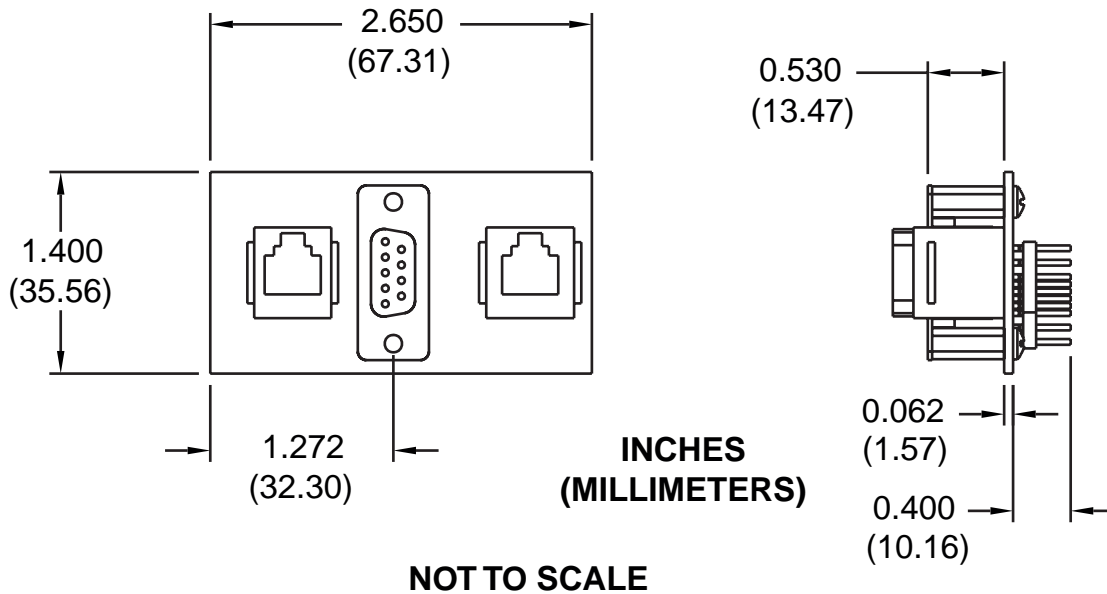
NOT TO SCALE

Figure 23. Frame Connector Module Dimensions (not to scale)

.750 DIA.
(19.05)

**INCHES
(MILLIMETERS)**

0.087
(2.21)

1.738
(44.15)

0.625
(15.88)

0.693
(17.60)
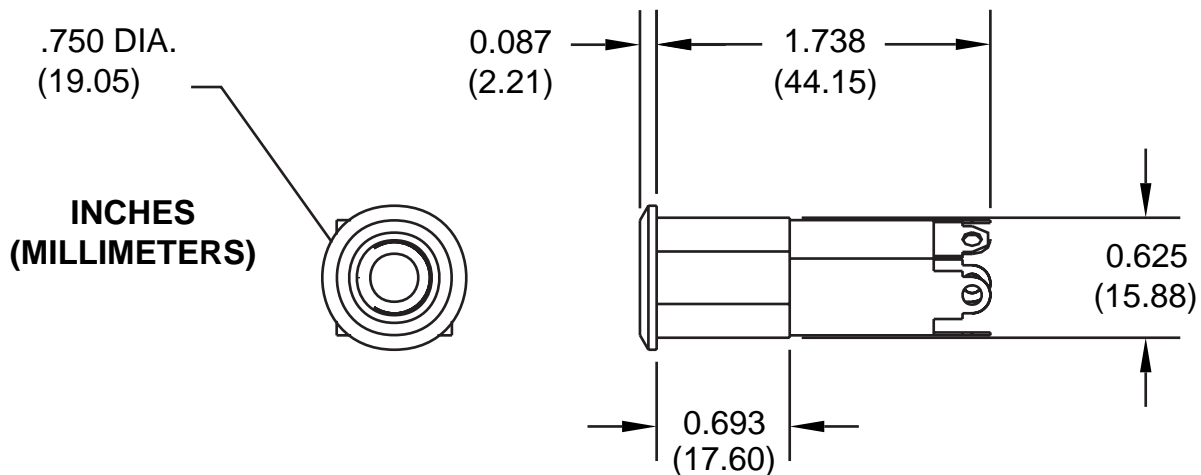
NOT TO SCALE

Figure 24. Gooseneck Microphone Connector Dimensions (not to scale)

**INCHES
(MILLIMETERS)**

0.077
(1.95)

.299 R (2 PLS)
(7.60)

0.575
(14.60)

BUSHING OUTLINE
.750 DIA.
(19.05)

SCALE NOT ASSURED

Figure 25. Gooseneck Microphone Connector Panel Cutout Dimensions (scale not assured)

INCHES
(MILLIMETERS)

1.419
(36.04)

0.091
(2.31)

1.220
(30.99)

0.374
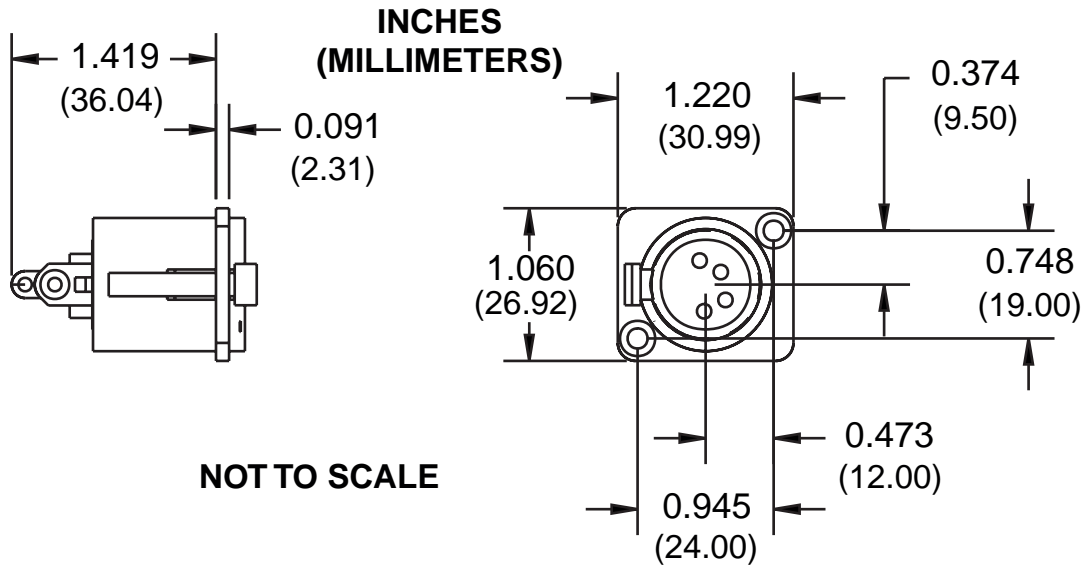(9.50)

1.060
(26.92)

0.748
(19.00)

0.473
(12.00)

0.945
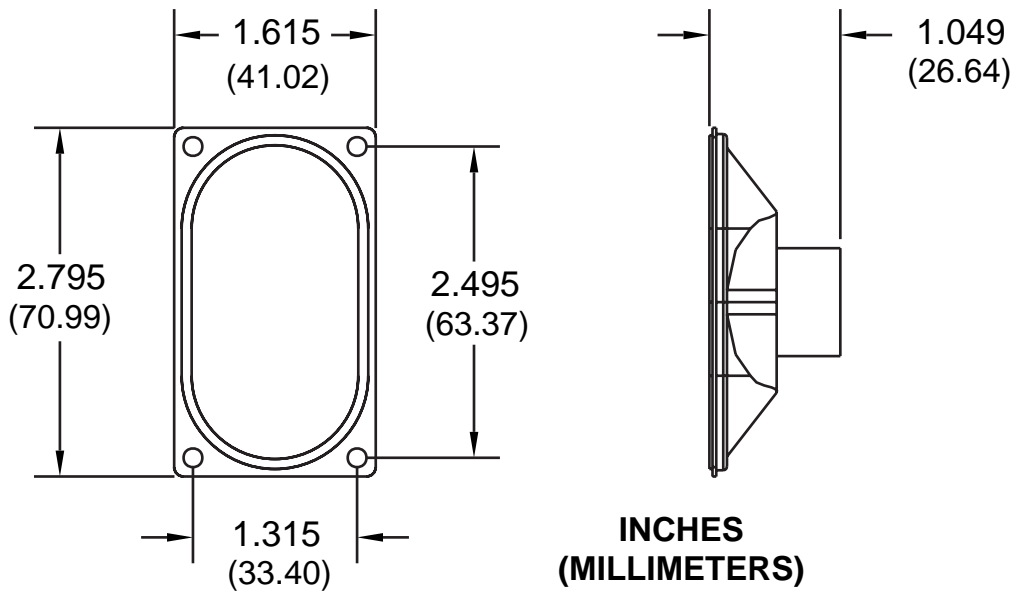(24.00)

NOT TO SCALE

Figure 26. XLR Connector Dimensions (not to scale)

INCHES
(MILLIMETERS)

0.748
(19.00)

.138 DIA.
(3.51)

0.374
(9.50)

XLR CONNECTOR
OUTLINE

0.472
(11.99)

0.944
(23.98)

1.220
(30.99)

.945 DIA.
(24.00)

0.137
(3.48)

0.156
(3.96)

SCALE NOT ASSURED

1.060
(26.92)
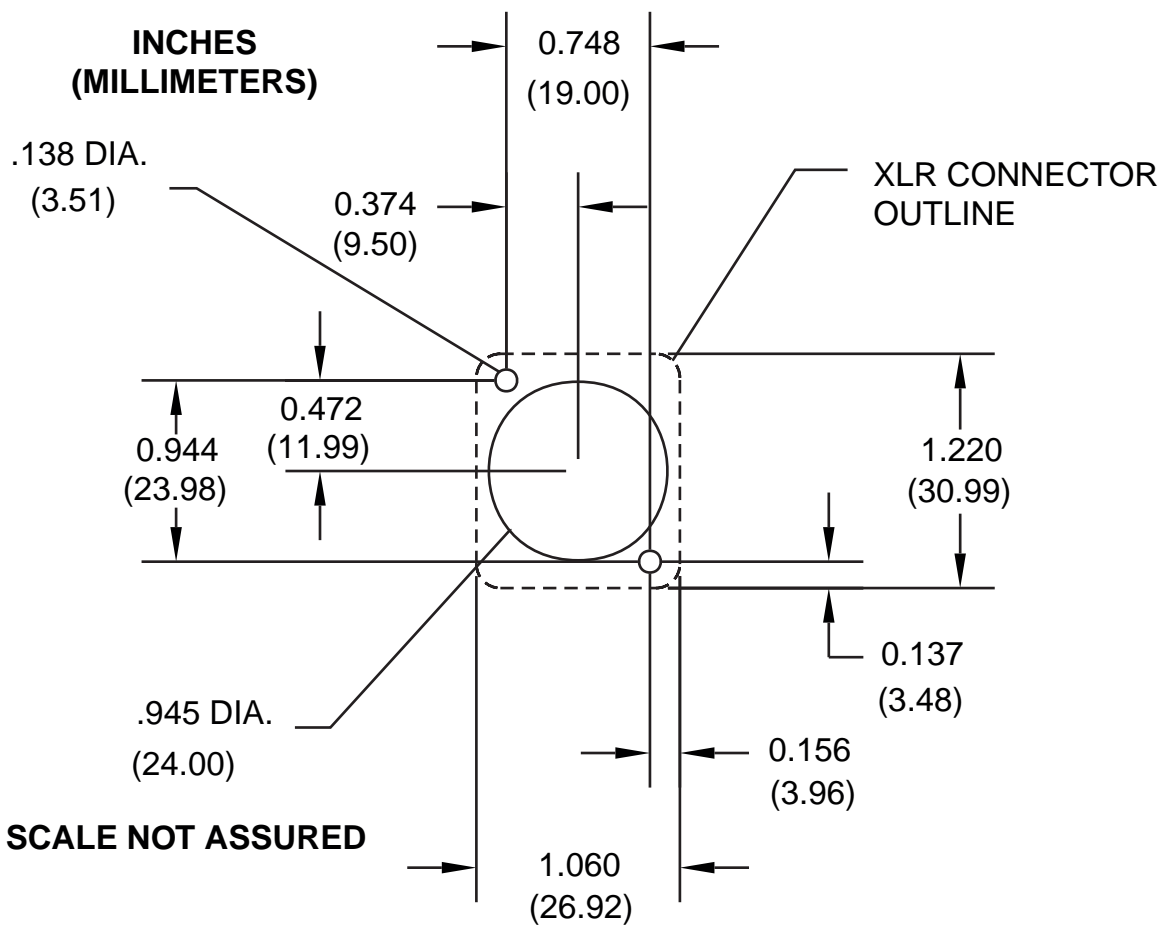
Figure 27. XLR Connector Panel Cutout Dimensions (scale not assured)

5.421 (137.69)

3.310 (84.07)

2.207 (56.06)

0.400 (10.16)

1.500 (38.10)

0.453 (11.51)

0.062 (1.57)

1.103 (28.02)

4.413 (112.09)

0.400 (10.16)
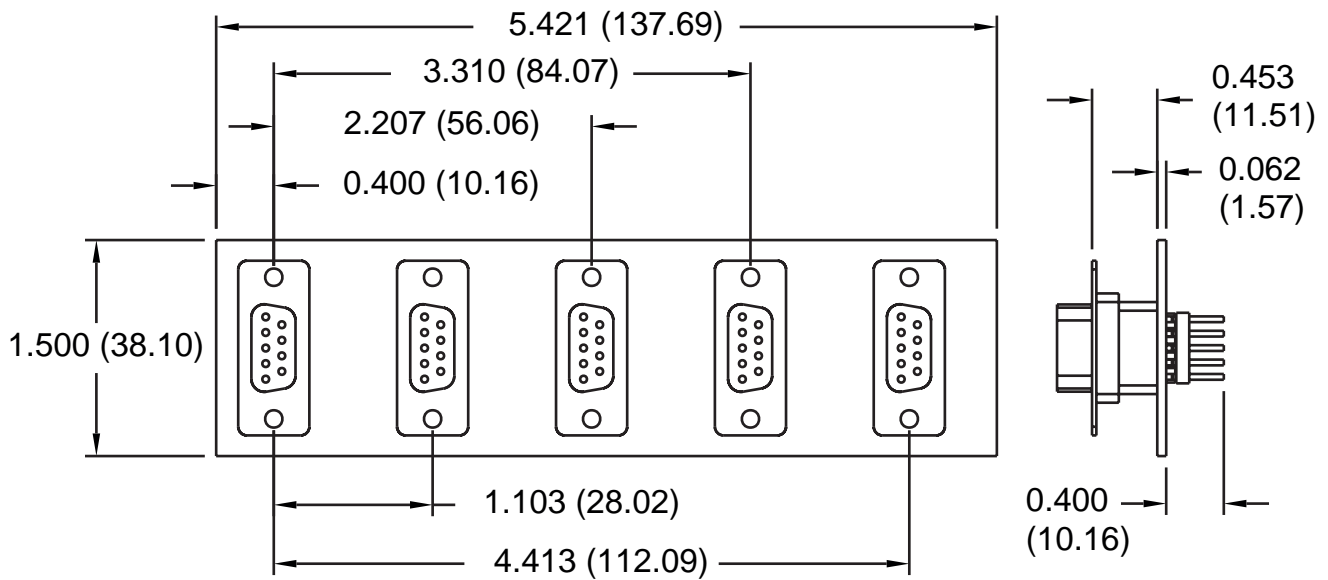
INCHES (MILLIMETERS)

NOT TO SCALE

Figure 28. GPI Module Dimensions (not to scale)

1.615 (41.02)

1.049 (26.64)

2.795 (70.99)

2.495 (63.37)

1.315 (33.40)

INCHES (MILLIMETERS)

NOT TO SCALE

29. Speaker Dimensions (not to scale)

SPEAKER OUTLINE

1.315 (33.40)

0.658 (16.70)

.125 DIA. (3.18)

INCHES (MILLIMETERS)

2.496 (63.40)

1.190 (30.23)

0.653 (16.59)

.625 R. (15.88)

1.615 (41.02)

.150 (3.81)

2.795 (70.99)

0.150 (3.81)
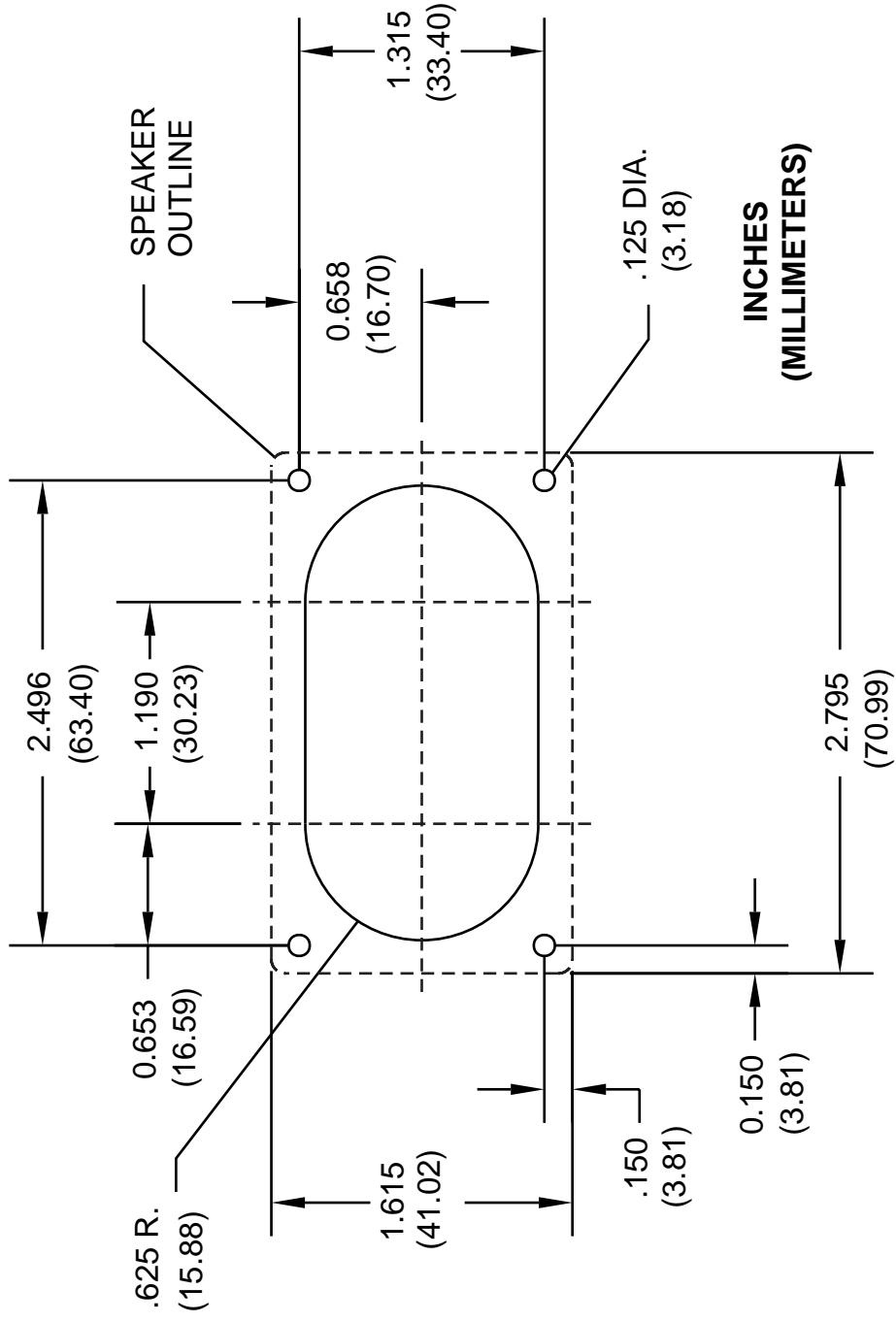
SCALE NOT ASSURED

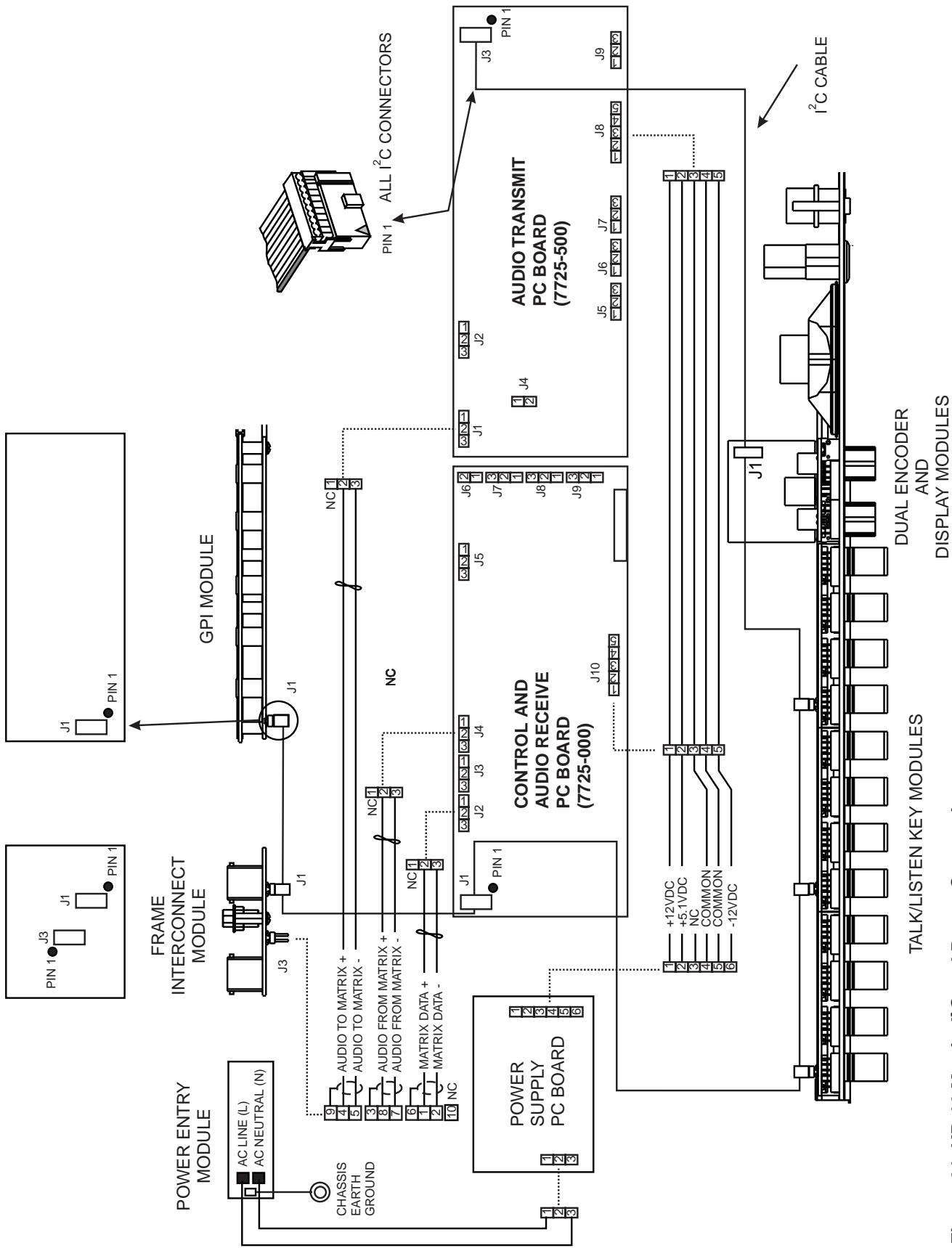*Figure 30. Speaker Cutout Dimensions (scale not assured)*
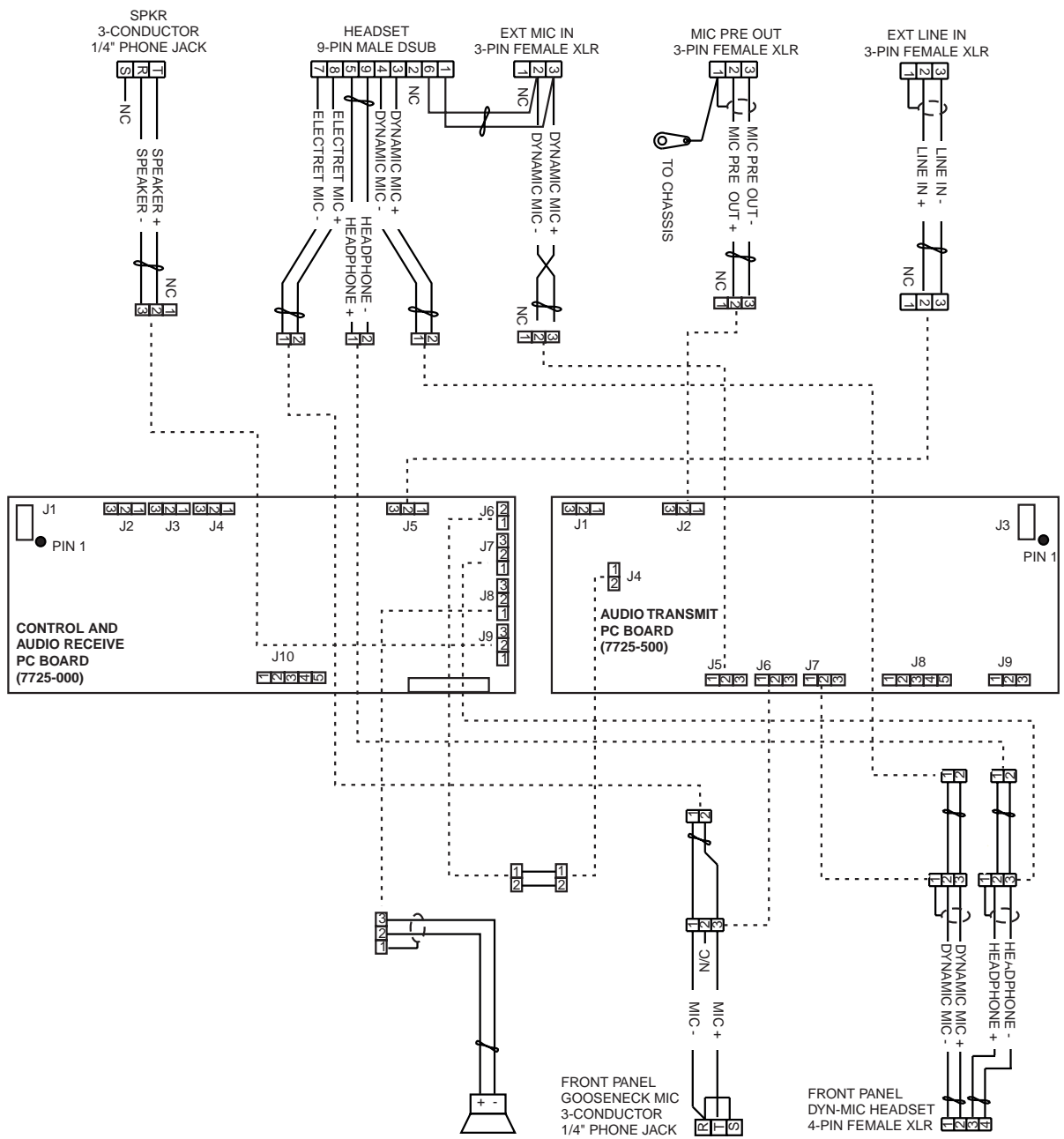
Figure 31. *KP-12 Matrix, I²C and Power Connections*

Figure 32. KP-12 Audio Connections