PUB 47102

Bell System

TECHNICAL REFERENCE

MINIATURE PLUGS AND JACKS

DECEMBER 1982

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TECHNICAL DESCRIPTION

Bell System
Miniature Plugs And Jacks

DECEMBER
1982

DIRECTOR - DISTRIBUTION SERVICES, INSTALLATION & MAINTENANCE

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TECHNICAL DESCRIPTION
BELL SYSTEM MINIATURE PLUGS AND JACKS

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

TABLE OF CONTENTS (CONTINUED)

LIST OF NOTES

1. GENERAL

The plugs and jacks described in this section represent the standard connectors to be used for connections to the telephone network. The plug and jack designs shown are representative of generic types, and should not be interpreted as the only designs that may be used. Design innovation and improvement is expected; but for interchangeability to be maintained, alternative designs (the "or equivalent" permitted in Section 68.104 subpart F of Part 68 of the FCC Rules and Regulations) must be compatible with the plugs and jacks shown. The interface dimensions between mating plugs and jacks must be maintained.

Hardware used to mount, protect, and enclose standard jacks is described in Addendum 1. The only requirement on connecting blocks, housings, dust covers, outdoor boxes, and the like that contain standard network jacks is that they accept standard plugs.

For special purpose applications, plugs may be made longer than shown or adapted for direct use on equipment or apparatus without cordage. The sliding modular plug used on the back of many modular wall telephone sets is an example of such a special purpose application. It is the responsibility of the designers and manufacturers of communication equipment who use such plugs to assure that they are compatible with the hardware used to mount standard jacks with which they plan to interface.

1.1 Introduction

This Technical Reference illustrates certain Bell System Miniature Plugs and Jacks. The original issue dated August 1976, provided the product information required by the Federal Communications Commission in its Report and Order, Docket No. 20774 released July 12, 1976, adopting standard plug and jack designs for connection of all telephone terminal equipment to the nationwide switched network. This document is being reissued to provide minor corrections to some of the original material, add the 8-position jack, add Addendum 1, and to include those changes recently proposed for inclusion to subpart F of Part 68 of the FCC Rules and Regulations. The descriptions in this document are to be considered functionally equivalent to the descriptions contained within subpart F of Part 68, Chapter 1 of Title 47 of the Code of Federal Regulations. These descriptions represent the Bell System design intent to assure proper interface for the miniature plugs and jacks.

1.2 Bell System Miniature 6-Position Plug

A Bell System miniature 6-position plug (see Figure 1) consists of an injection molded thermoplastic plug body equipped with slots for accepting contact blades ("6-position" identifies the maximum size capacity of the plug, although not all positions may be equipped with contacts).

The plug body is normally affixed mechanically to the cord with each conductor located under the correct slot. Contact blades are then inserted into each slot. Each contact blade includes features that lock it in place and tangs that pierce the insulation making electrical contact with the conductor located under the associated slot. This Bell System 6-position plug was designed for assembly to flat cordage to facilitate conductor location during the assembly operation, although it could be designed to accept round cordage.

The dimensions shown in Figures 2 and 3 should permit all 6-position plugs to work with all mating 6- and 8-position standard jacks. Plug size, front stop, and locking tab dimensions shown are critical since departure from them can lead to plugs which will not fit or latch into standard jacks. Plugs longer than specified in Figures 2 and 3, or plugs with adaptive features or oversize cordage, must be capable of interfacing with the modular connecting blocks and adapters described

in Addendum 1 to be compatible with Bell System standard hardware. In general, adaptive features on plugs that are within the size envelope of the 267A adapter shown in Addendum 1, Figures 27A and 28A will interface with standard Bell System connecting blocks used for voice and permissive data equipment but will inhibit the protective features of connecting blocks designed for use in high contaminant and high condensate level locations (e.g. see 625S connecting block shown in Addendum 1, Figure 6A).

The Bell System plugs include dielectric barriers between contact blades and across the ends of the conductors to help prevent electrical breakdown failures.

The gauges shown in Figures 4 and 5 are essential for determining if assembled plugs meet maximum and minimum size requirements. The 0.264 X 0.384 maximum height and width Go Gauge dimensions should not be exceeded over a minimum length of 0.460, measured from Datum -A-, shown in Figure 2.

1.3 Bell System Miniature 6-Position Jack

The Bell System miniature 6-position jacks consist of an assembly of an injection molded thermoplastic frame containing a plug-receiving cavity and a jack top containing multiple holes for up to 6 contact springs. These contact springs are spliced to stripped individual insulated conductors. Bell System jacks may be molded as an integral part of the apparatus or the apparatus might be designed to accept a snap-in version of a jack assembly and/or jack top assembly. One such connecting block assembly with a standard jack is illustrated in Figure 6.

Dimensions shown in Figures 7 and 8 permit all 6-position plugs to mate with this jack. Figure 8 defines the spring wire location coordinates for the 6-position jack. Plug-receiving cavity and plug stop dimensions shown are critical since departure from them can lead to jacks which will not properly accept standard plugs.

The gauges specified in Note 10 on Page 15 are essential for determining if assembled jacks meet maximum and minimum size requirements.

1.4 Bell System Miniature 8-Position Plug

The Bell System miniature 8-position plug (see Figure 9) is similar in construction to the 6-position plug shown in Figure 1, except that it can be equipped with up to 8 contacts. The Bell System 8-position plug was designed for assembly to round twisted-pair cordage to reduce potential crosstalk problems, although it can be designed to accept flat cordage.

The dimensions shown in Figures 10 and 11 permit all 8-position plugs to work with all mating 8-position standard jacks and connecting blocks. Plug size, front stop and locking tab dimensions shown are critical since departure from them can lead to plugs that will not fit or latch into 8-position standard jacks. The .264 X .464 maximum height and width Go Gauge dimensions should not be exceed over a length of not less than .467 inches measured from Datum -A-, shown in Figure 10.

The Bell System plugs include dielectric barriers between contact blades and across the ends of the conductors to help prevent electrical breakdown failures.

The gauges shown in Figures 12 and 13 are essential for determining if assembled plugs meet maximum and minimum size requirements.

1.5 Bell System Miniature 8-Position Jack

The Bell System miniature 8-position jack (Figure 14) is similar in construction to the 6-position jack except that each jack may be equipped with up to 8 contact springs.

Dimensions shown in Figure 15 and 16 permit all 6-position and 8-position non-keyed plugs to work with this jack. Plug-receiving cavity and plug stop dimensions shown are critical since departure from them can lead to jacks which will not properly accept standard plugs.

The gauges specified in Note 10 on Page 26 are essential for determining if assembled jacks meet maximum and minimum size requirements.

1.6 Bell System Miniature 8-Position Series Jack

The Bell System miniature 8-position series jack (see Figure 17), is similar in construction to the 8-position jack except that with no plug inserted, conductors 1 and 4 are bridged as well as conductors 5 and 8. When a miniature 8-position plug is inserted into the jack, the bridges are removed from these conductors and a series connection can be made to both sides of the line. The bridge connection remains unbroken when a standard 6-position plug is inserted.

Dimensions shown in Figures 18 and 19 should permit all 6 and non-keyed 8-position plugs to work with this jack. Plug-receiving cavity and plug stop dimensions shown are critical since departure from them can lead to jacks which will not properly accept these standard plugs.

The gauges specified in Note 10 on Page 31 are essential for determining if assembled jacks meet maximum and minimum size requirements.

1.7 Bell System Miniature 8-Position Keyed Plug

The Bell System miniature 8-position keyed plug (see Figure 20) is the same as the 8-position plug except for the addition of a protrusion to prevent insertion of the keyed plug into an unkeyed jack.

The dimensions shown in Figures 21 and 22 permit all 8-position keyed plugs to work with all mating 8-position keyed jacks. Plug size, front stop key protrusion, and locking tab dimensions shown are critical since departure from them can lead to plugs that will not fit or latch into jacks. The .264 X .464 maximum height and width Go Gauge dimensions should not be exceeded over a length of not less than .467 inches measured from Datum -A-, shown in Figure 21.

The Bell System keyed plugs include dielectric barriers between contact blades and across the ends of the conductors to help prevent electrical breakdown failures.

The gauges shown in Figures 23 and 24 are essential for determining if assembled plugs meet maximum and minimum size requirements.

1.8 Bell System Miniature 8-Position Keyed Jack

The Bell System miniature 8-position keyed jack (see Figure 25) is similar in construction to the 8-position jack, except that it contains a recess to accommodate the protrusion on the 8-position keyed plug.

Dimensions shown in Figure 26 permits all 6-and 8-position plugs and 8-position keyed plugs to work with this jack. Plug-receiving cavity, key recess, and plug stop dimensions shown are critical since departure from them can lead to jacks which will not properly accept standard plugs.

Gauges shown in Note 10 on Page 41 are essential for determining if assembled jacks meet maximum and minimum size requirements.

1.9 Contact Requirements

Specific requirements are shown in Figure 27. A gold interface surface (or equivalent) should be used to provide a connection having a high degree of resistance to corrosion and contamination with a minimum contact force of 100 gms. A smooth non-porous contact surface is required to avoid corrosive activity and excessive abrasive wear at the plug-jack interface.

2. ADDENDUM 1 — BELL SYSTEM MODULAR CONNECTING BLOCKS AND ADAPTERS FOR VOICE AND PERMISSIVE DATA EQUIPMENT

Addendum 1 (attached) includes specification sheets depicting the front face topography for all the major Bell System Network Connecting Blocks and Adapters. All internal jack and external plug dimensions are controlled by the specifications on these topography sheets as well as the applicable specifications referenced in the Figures of this Technical Description. Dimensions given are critical for assuring proper interface of modular hardware with standard plugs and jacks.

MINIATURE 6 POSITION PLUG

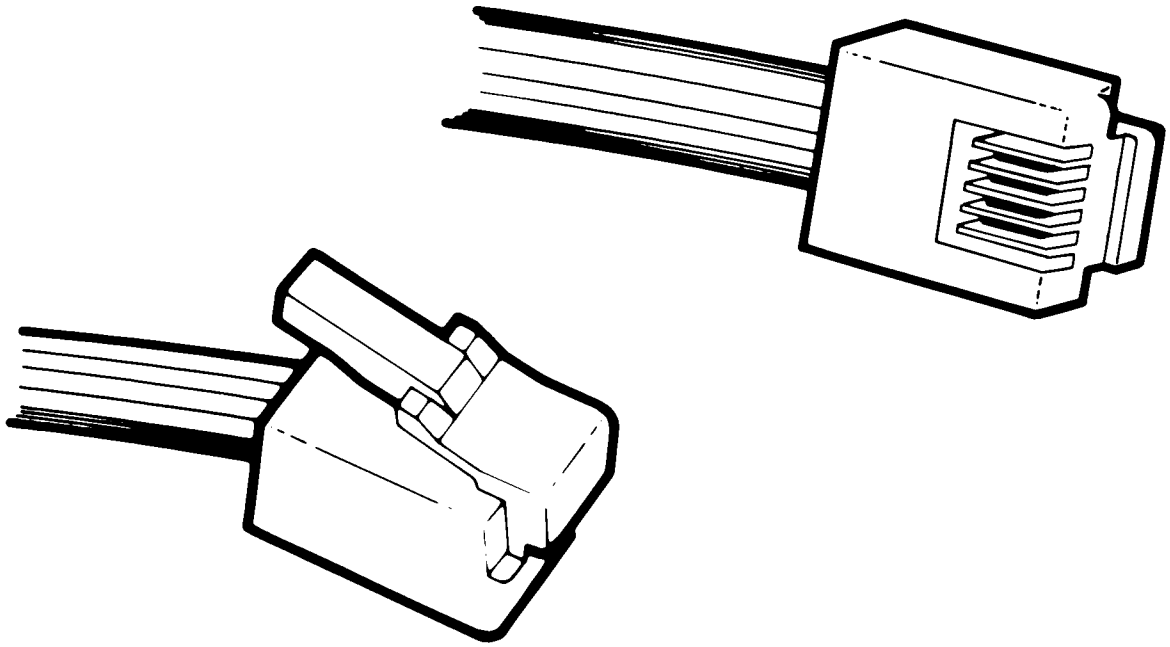
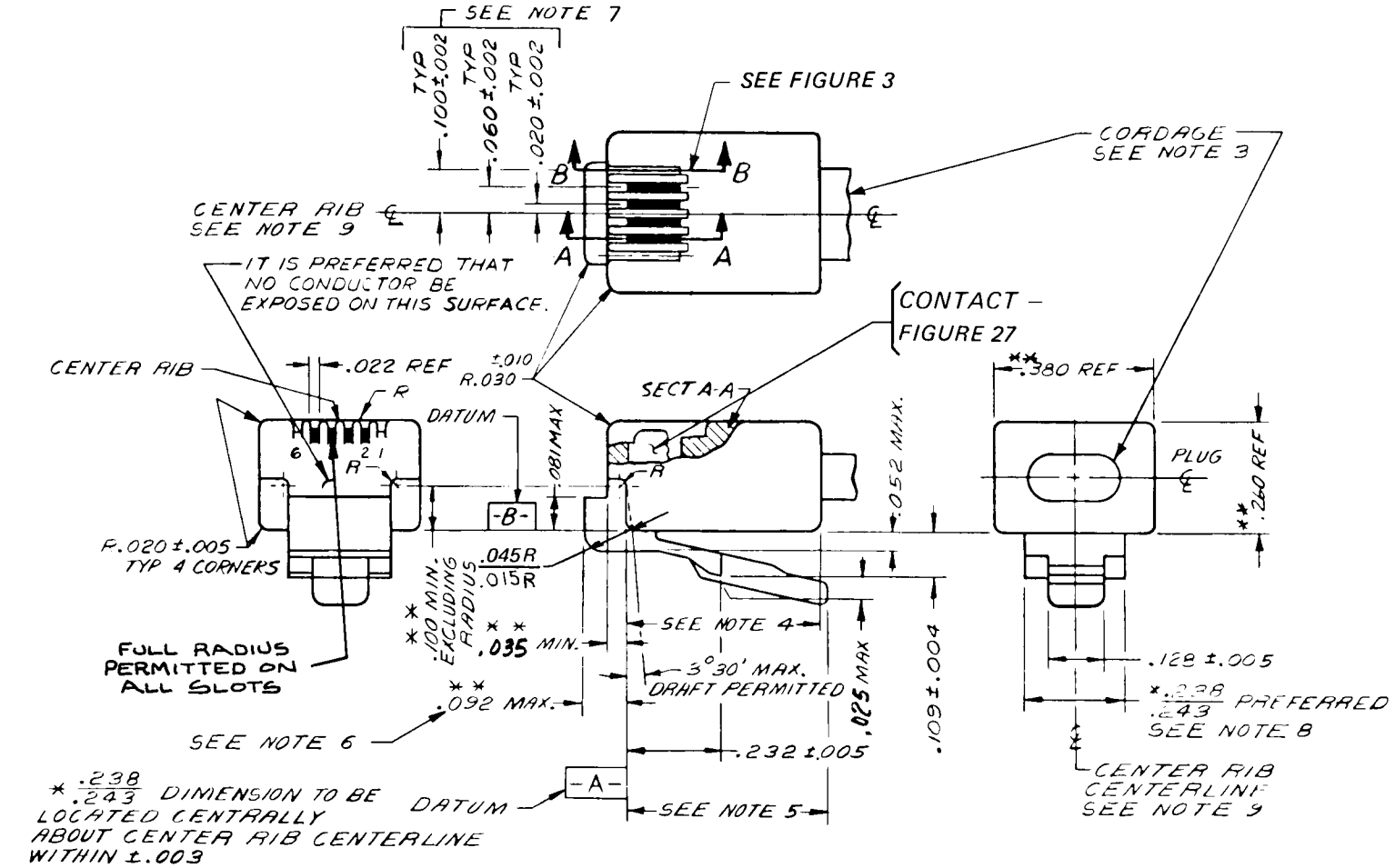


Figure 1

(Note: This plug is depicted equipped with 4 contacts; it may be fabricated with its full 6 contact capability.)



NOTE: ALL NOTES FOLLOW FIGURE 3

Figure 2

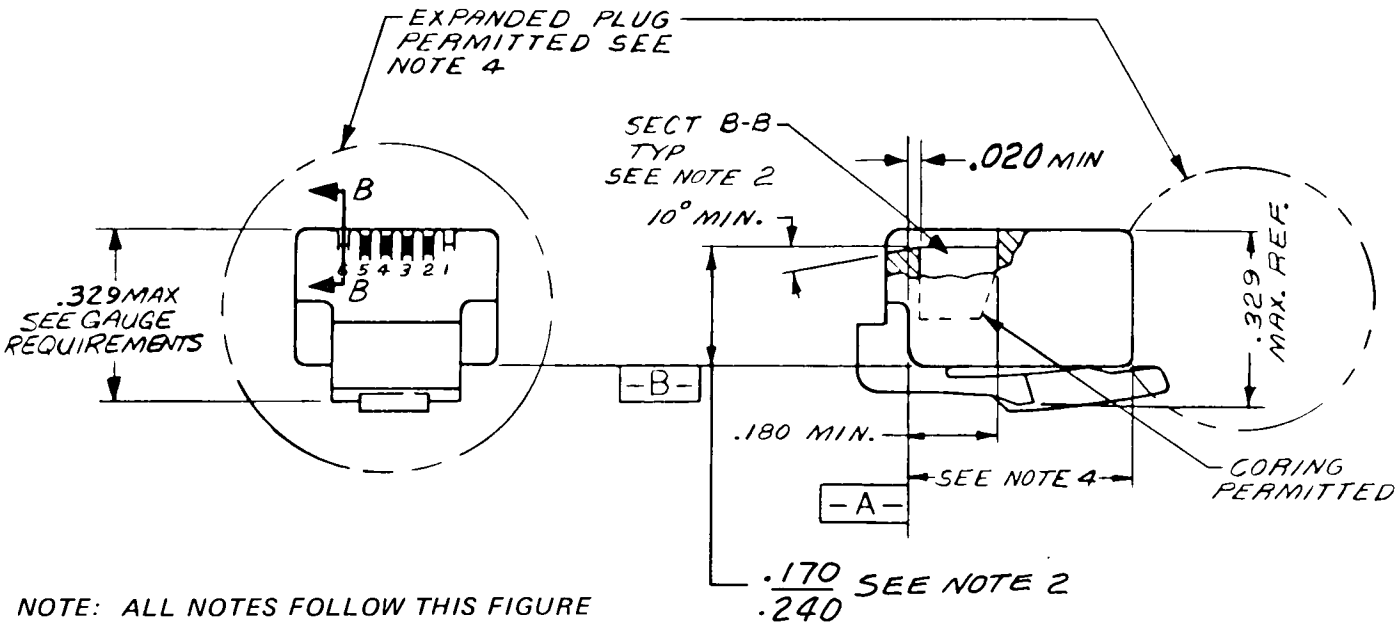


Figure 3

NOTE: ALL NOTES FOLLOW THIS FIGURE

6-POSITION PLUG, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 2 & 3)

1. All plugs must be capable of meeting the requirements of the plug go and no-go gauges.

2. Section BB applies to any jack contact receiving slot which does not contain a plug contact.

3. The preferred major cordage cross section is .100 inch max. thick by .200 inch max. wide, with rounded corners. It should exit the plug on the plug centerline. Other cordage configurations are permitted but may inhibit the special features of some network jack enclosures.

4. The standard plug length is .460 inch max. Plugs may be made longer than standard or adapted for direct use on special cords, adapters without cordage, and on apparatus or equipment subject to the limitations described in the general paragraph of this document. Plugs longer than standard may inhibit the special features of some network jack enclosures.

5. A .474 inch minimum tab length is required. It is preferred that a maximum tab length be no longer than .520 inch. Longer tabs may be used with the same limitations as described in Note 4.

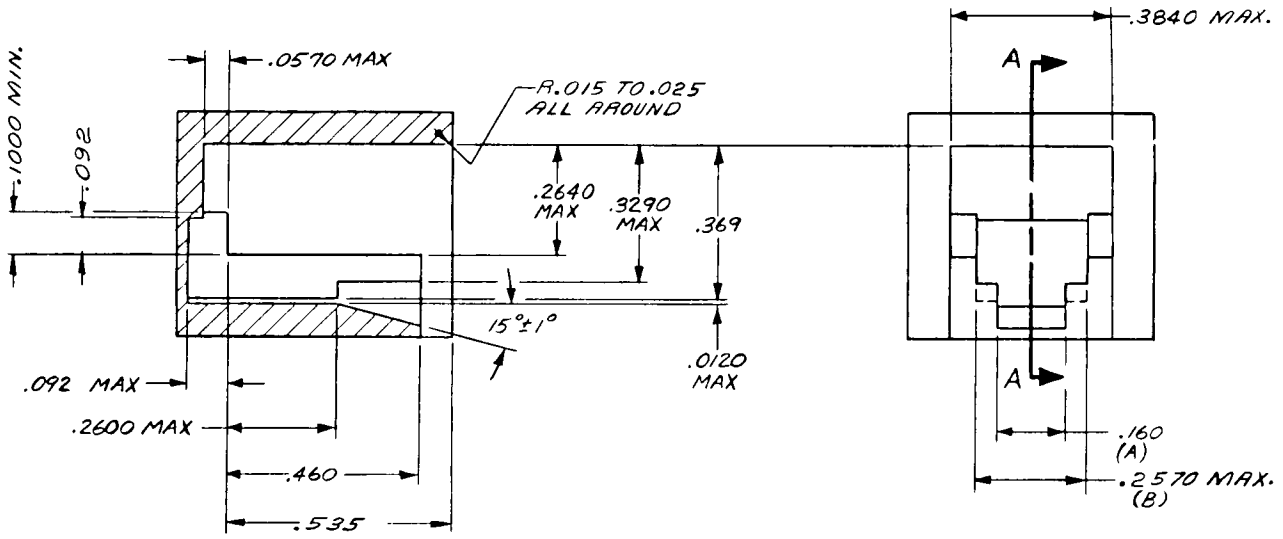
6. To obtain maximum plug guidance when 6-position plugs are inserted in 8-position jacks, it is desirable to extend the front plug nose to the .092 inch maximum.

7. These dimensions apply to the location of jack contact receiving slots. It is desirable that plug contacts be centered axially in these slots, but centering is not required.

8. The .238/.243 dimension is preferred to obtain maximum plug guidance in jacks with more than 6 conductors. A tolerance range of .233/.243 is permitted, but may create targeting problems in 8-position jacks.

9. The center rib centerline shall be coincident with the plug width (.380 Ref.) centerline within $\pm$ .003 inch.

MINIATURE 6 POSITION PLUG MAXIMUM PLUG SIZE



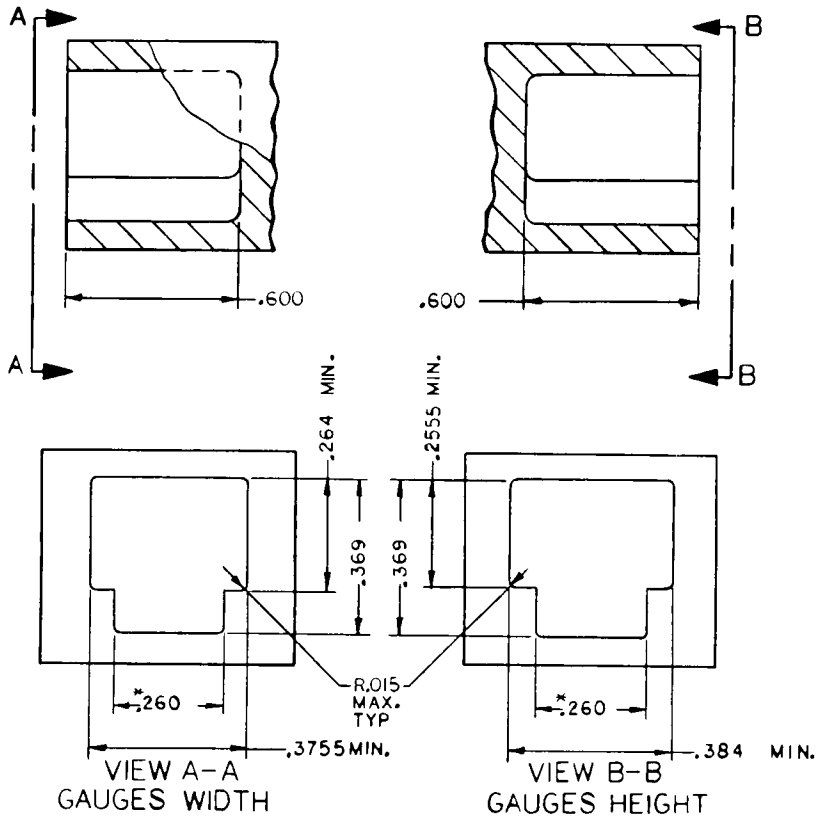
GO GAUGE

Figure 4

Notes:

1. The plug shall be capable of insertion and latching into the gauge with 5 pounds or less insertion force. Plug latching bar shall be depressed so as not to interfere with the plug entry. After insertion and latching, plug shall be capable of removal, with the latch depressed, with a removal force of 10 pounds or less applied at an advantageous angle.
2. Dimensions given to three decimal places shall be within ±.002 inch.
3. Dimensions (A) and (B) to be centrally located with respect to .3840 max. jack opening width within ±.001 inch.
4. Do not scale drawings for external configuration.

MINIATURE 6 POSITION PLUG MINIMUM PLUG SIZE



NO – GO GAUGE

Figure 5

1. The plug shall not be capable of entering the gauge more than .070 inch beyond datum –A– (see figure 2 with 2.0 pounds insertion force.
2. Non-toleranced dimensions given to three places shall be within ±.002 inch.
3. *.260 Dimension to be centrally located with respect to .384 minimum and .3755 minimum within ±.002 inch.

MINIATURE 6 POSITION JACK (EQUIPPED WITH 4 CONTACTS)

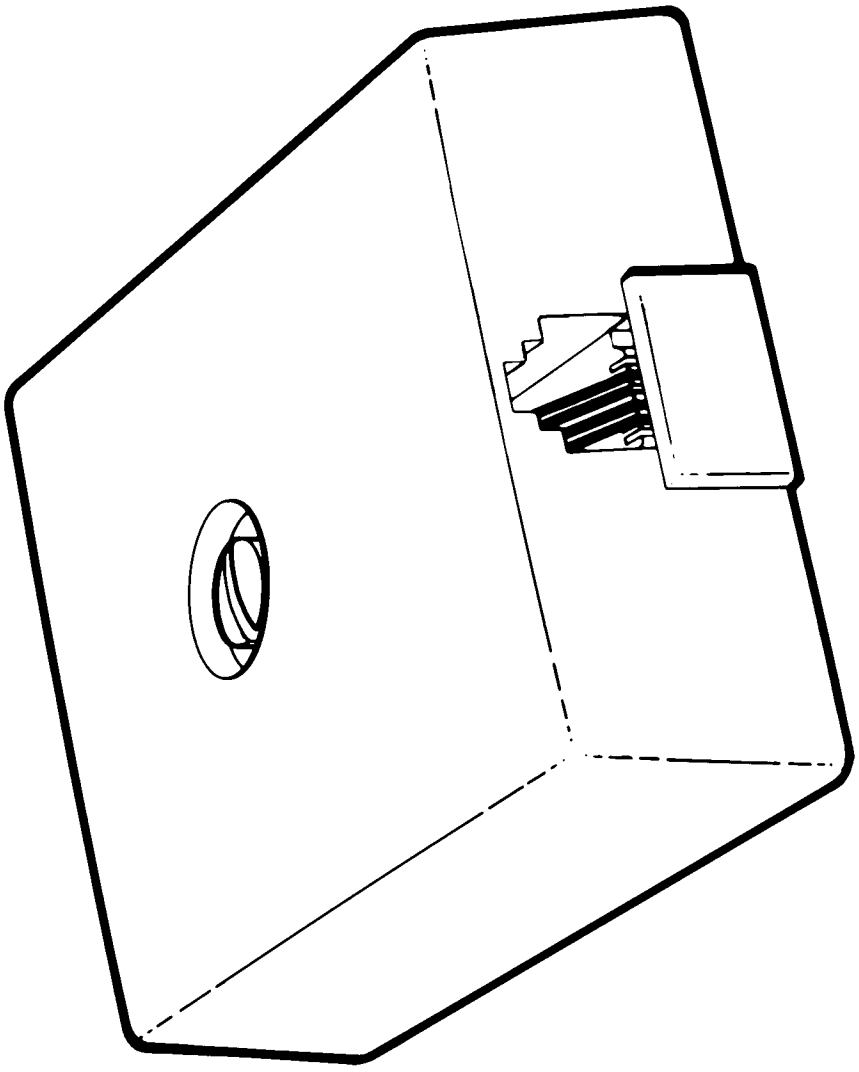
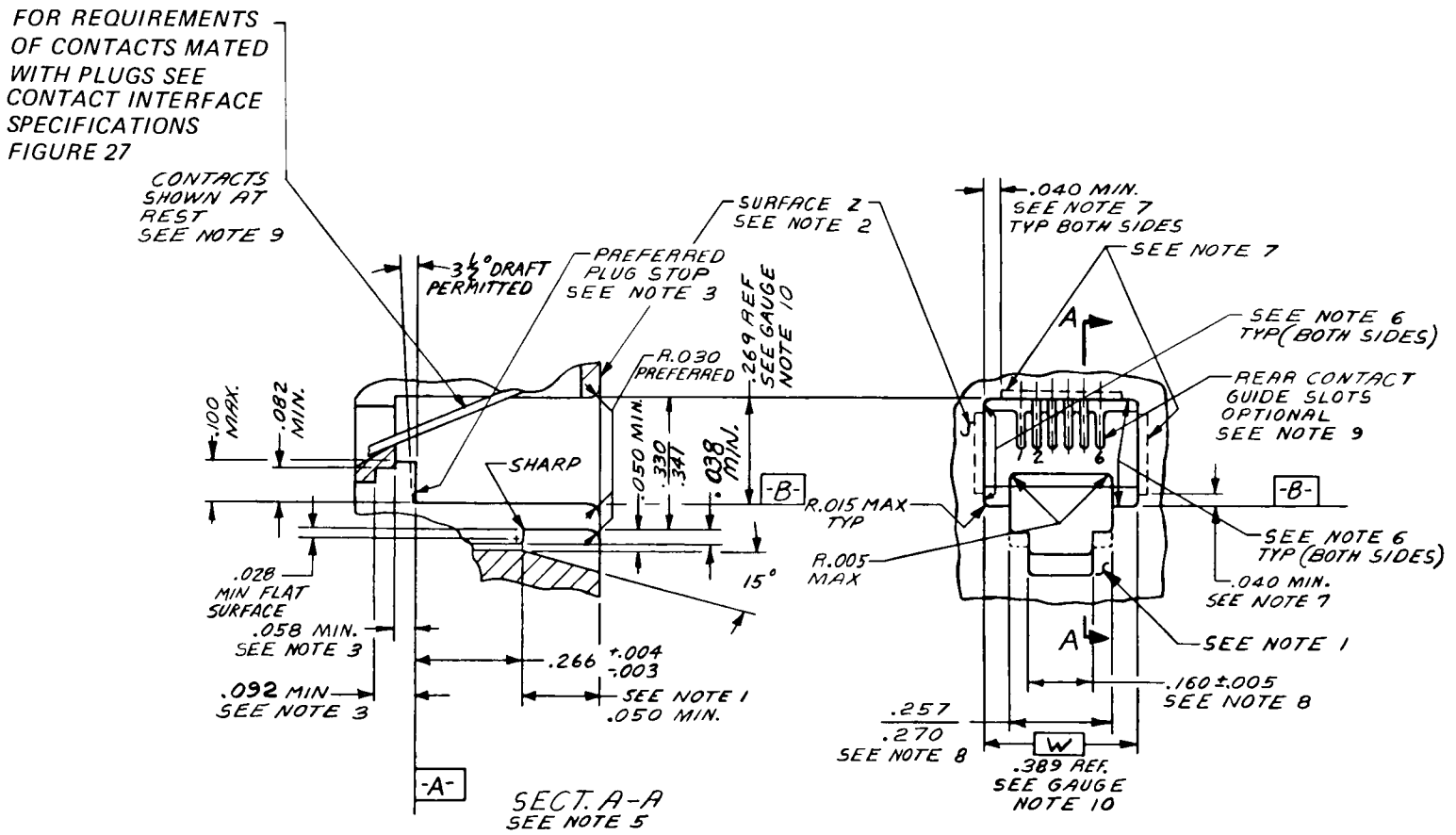


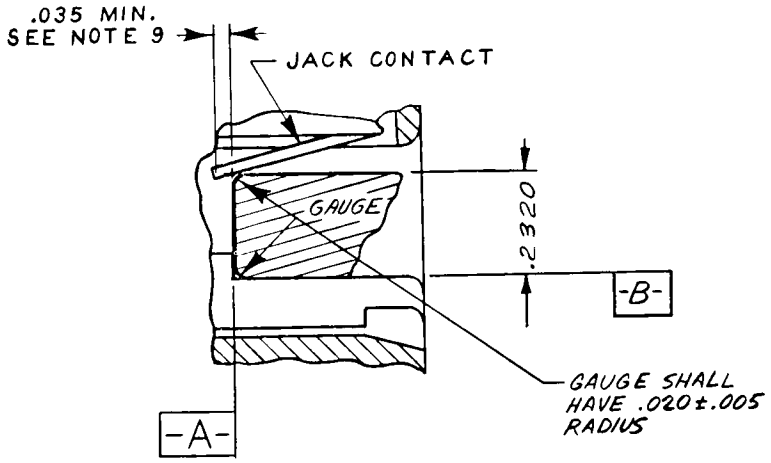
Figure 6

(Note: This jack is depicted equipped with 4 contacts; it may be fabricated with its full 6 contact capacity.)

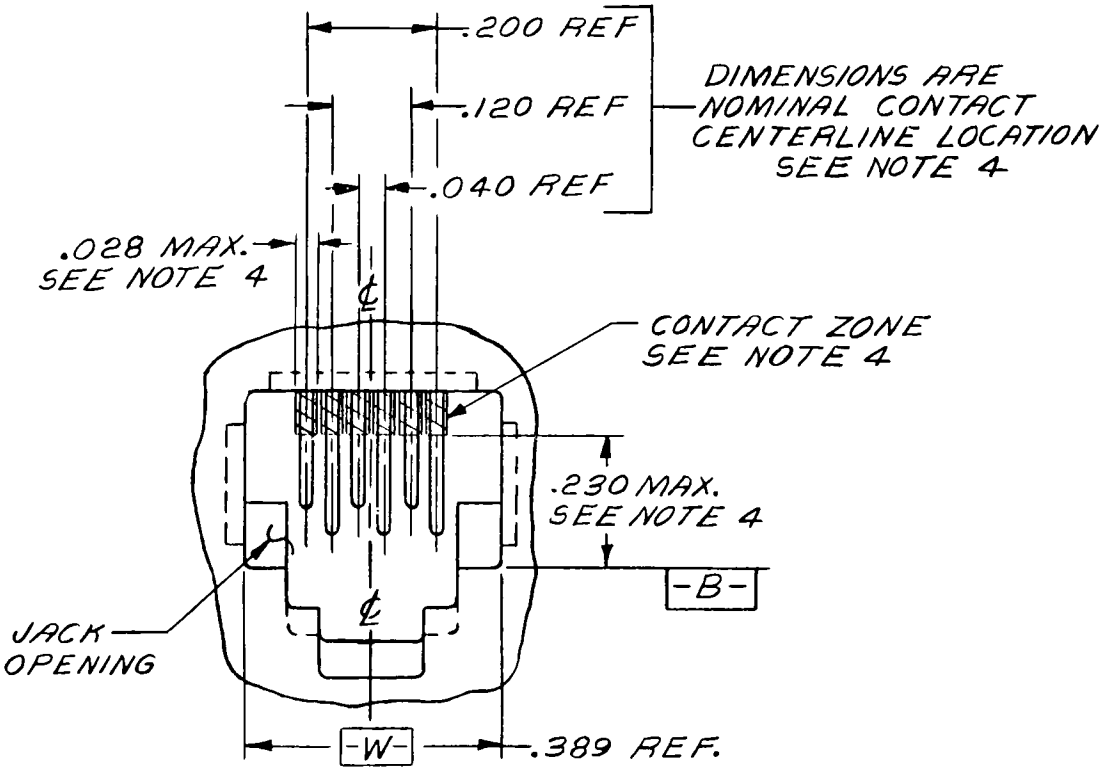


NOTE: ALL NOTES FOLLOW FIGURE 8 UNLESS SPECIFIED.

Figure 7



SECT. A-A
(SHOWN WITHOUT REAR CONTACT GUIDES)



VIEW OF CONTACT ZONE

(SHOWN WITHOUT REAR CONTACT GUIDES)

Figure 8

NOTE: ALL NOTES FOLLOW THIS FIGURE

6-POSITION JACK, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 7 & 8)

1. Front surface projections beyond the .050 min. shall be configured so as not to prevent finger access to the plug release catch (Reference Figures 2 & 3, 6-Position Plug, Specifications). A catch length greater than .050 is beneficial in providing greater breakout strength.

2. Surface Z need not be planar or coincident with the surface under the plug release catch. Surface Z projections must not prevent insertion, latching, and unlatching of the standard 6-position plug described in Figures 2 & 3.

3. The preferred plug stop surface is indicated. If some other internal feature is used as a plug stop, it must be located so that the axial movement of a latched plug is not greater than 0.045 inch.

4. To prevent mistargeting between the plug and jack contacts, the jack contacts should be completely contained in their individual contact zones (.028 inch max. wide) where they extend into the jack openings. There is no location requirement for jack contacts below these zones (.230 inch max.), but adequate contact separation must be maintained to prevent electrical breakdown. These shaded contact zones should be centrally located (include all locating tolerances) about the jack opening width .389 Ref. (Datum -W-). Contacts located outside of these zones may result in mistargeting between the jack and plug contacts.

5. All inside and outside corners in the plug cavity to be .015 inch radius max. unless specified.

6. These surfaces shall have $0^{o}15'$ maximum draft.

7. Relief inside the dotted areas on 3 sides of the jack opening is permitted. The .269 Ref. and .389 Ref. Gauge Requirements must be maintained in each corner (Ref. 0.040 inch min) to assure proper plug/jack interface guidance. A .32 ± .005 relief on the top side (opposite plug catch) is required on jacks in connecting blocks which mount and connect portable wall telephones so as to assure interface with the special purpose sliding modular plug used on many wall telephone sets.

8. 0.160 and .257/.270 inch dimensions to be centrally located to jack opening width -W- within ± 0.007 inch.

9. Minimum acceptable jack contact length. When contact guide slots are used, the contacts must always be contained inside the guide slots and the contacts must move freely in the slots so as not to restrain plug insertion or damage jack contacts.

6-POSITION JACK, SPECIFICATION NOTES

NOTES: (Continued)

10. Gauge Requirements:

GO: The jack shall be capable of accepting a 0.3840 X 0.2640 inch gauge and the gauge shall be capable of being removed with a maximum force of 2 pounds.

NO GO: The jack shall not accept either a 0.3940 X 0.254 inch horizontal width of opening gauge of a .2740 X .376 inch vertical height of opening gauge. However, if either gauge is accepted, the force necessary to remove the gauge shall be minimum 3.0 ounces.

Removal forces do not include forces contributed by contact springs nor shall external forces be applied to the jack that will affect these removal forces.

Gauges shall have a 0.030 inch radius on the nose and a 0.015 inch radius on all edges with clearance provided for contacts.

(c) Miniature 8 - Position Plug, Unkeyed:

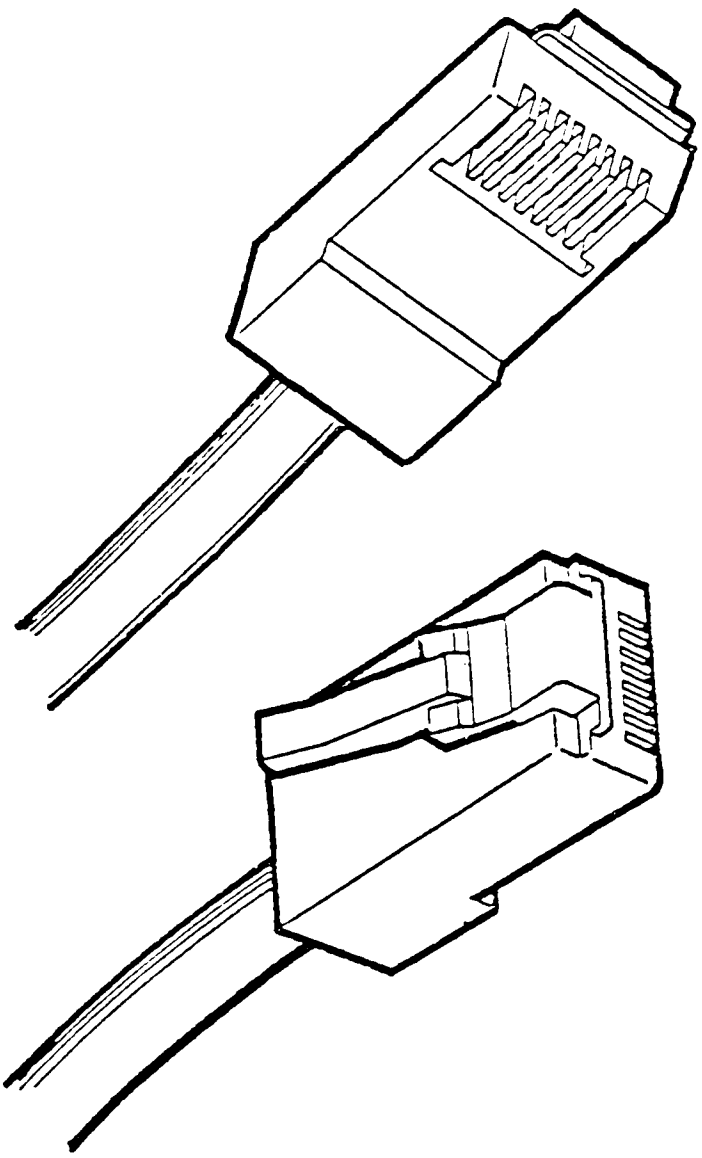
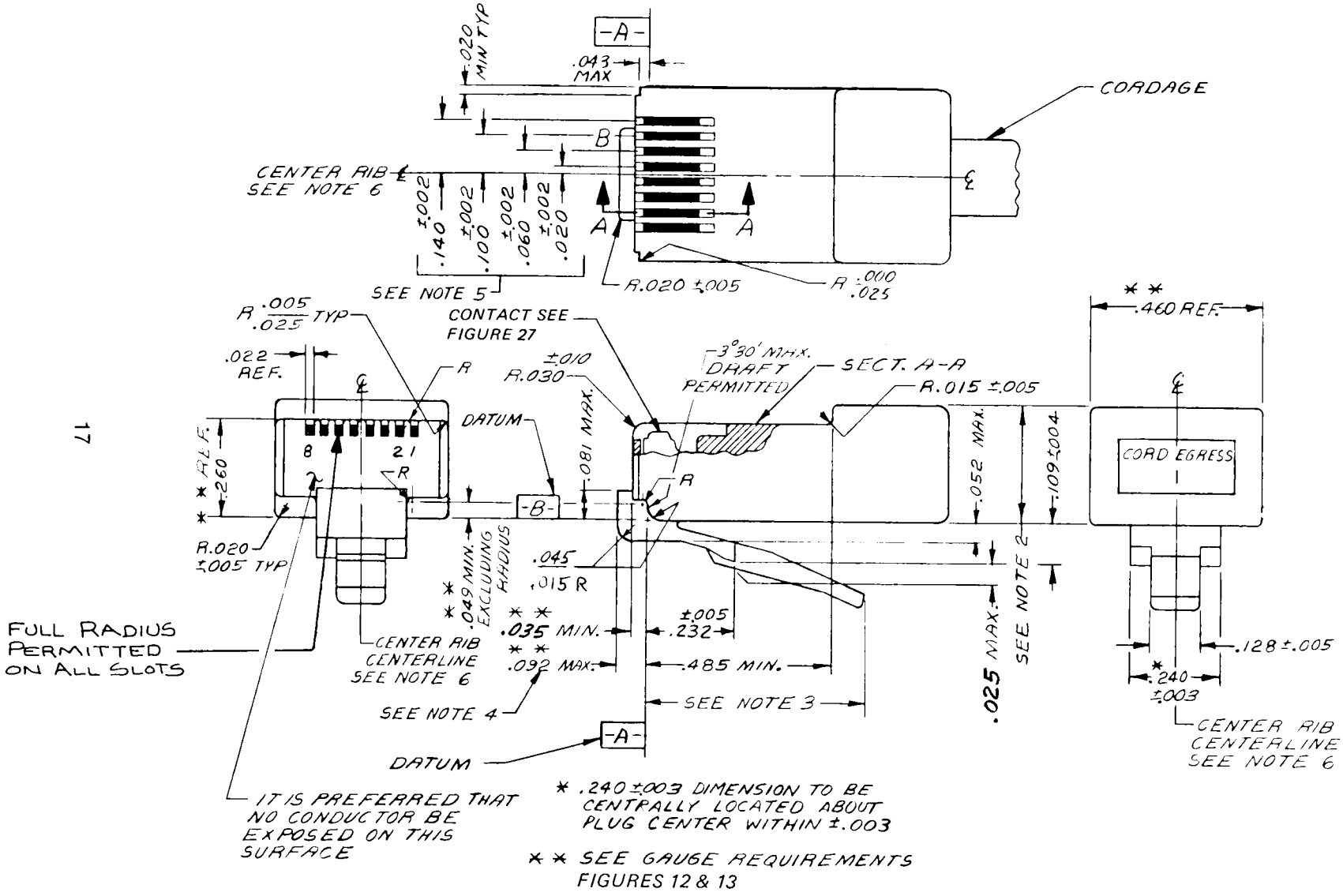


Figure 9

Note: This plug is depicted with its full 8 contact capacity. It may be fabricated with less than 8 contacts.



NOTE: ALL NOTES FOLLOW FIGURE 11

Figure 10

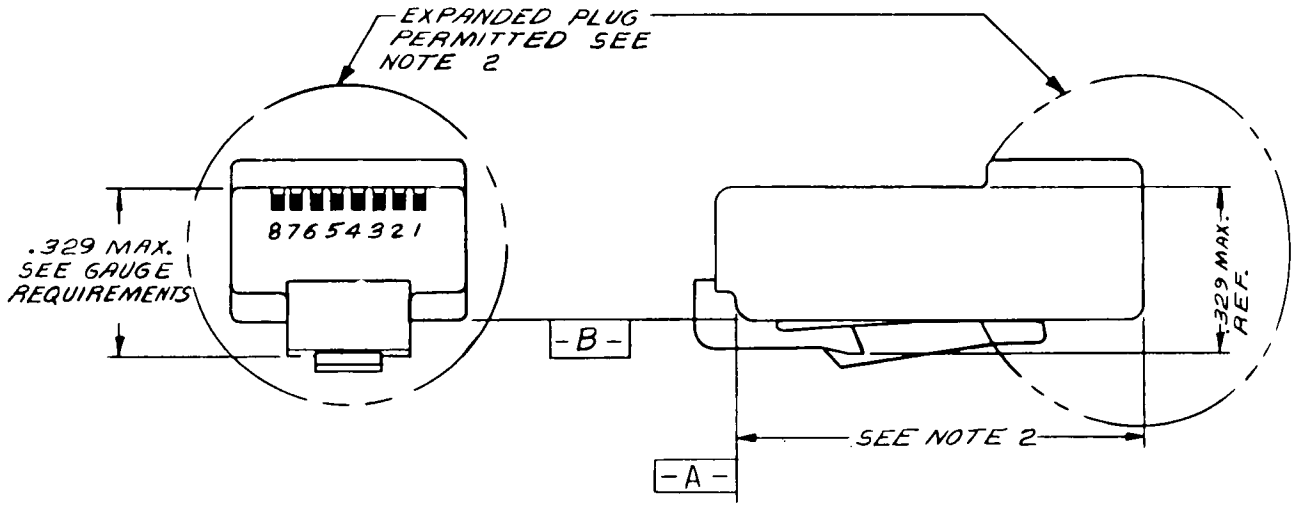


Figure 11

NOTE: ALL NOTES FOLLOW THIS FIGURE

8-POSITION UNKEYED PLUG, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 10 & 11)

1. All plugs must be capable of meeting the requirements of the plug go and no-go gauges.

2. The standard plug height in the area shown in .315 inch maximum. The standard plug length is .910 inch maximum. Plugs may be made longer than standard or adapted for direct use on special cords, adapters without cordage, apparatus or equipment subject to the limitations described in the general paragraph of this document. Plugs longer and/or higher than standard may inhibit the special features of some network jack enclosures.

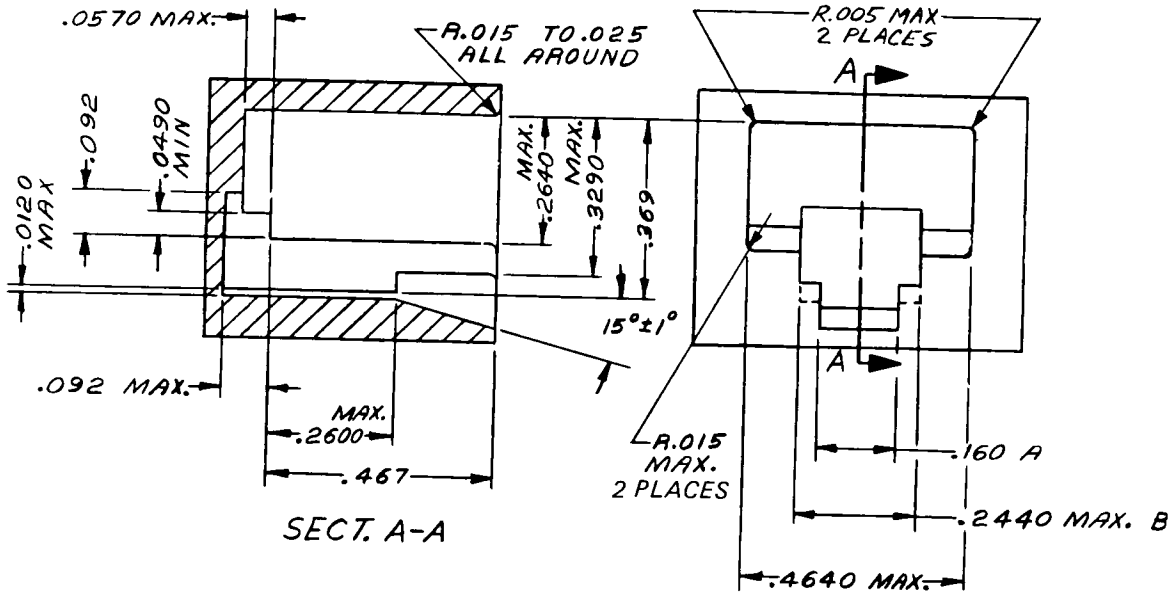
3. A .575 inch minimum tab length is required. It is preferred that a maximum tab length be no longer than .625 inch. Longer tabs may be used with the same limitations as described in Note 2.

4. To obtain maximum plug guidance in jacks, it is desirable to extend the front plug nose to the .092 inch maximum.

5. These dimensions apply to the location of jack contact receiving slots. It is desirable that plug contacts be centered axially in these slots, but centering is not required.

6. The center rib centerline shall be coincident with the plug width (.460 Ref.) centerline within $\pm$ .003 inch.

MINIATURE 8 POSITION UNKEYED PLUG, MAXIMUM PLUG SIZE



GO GAUGE

Figure 12

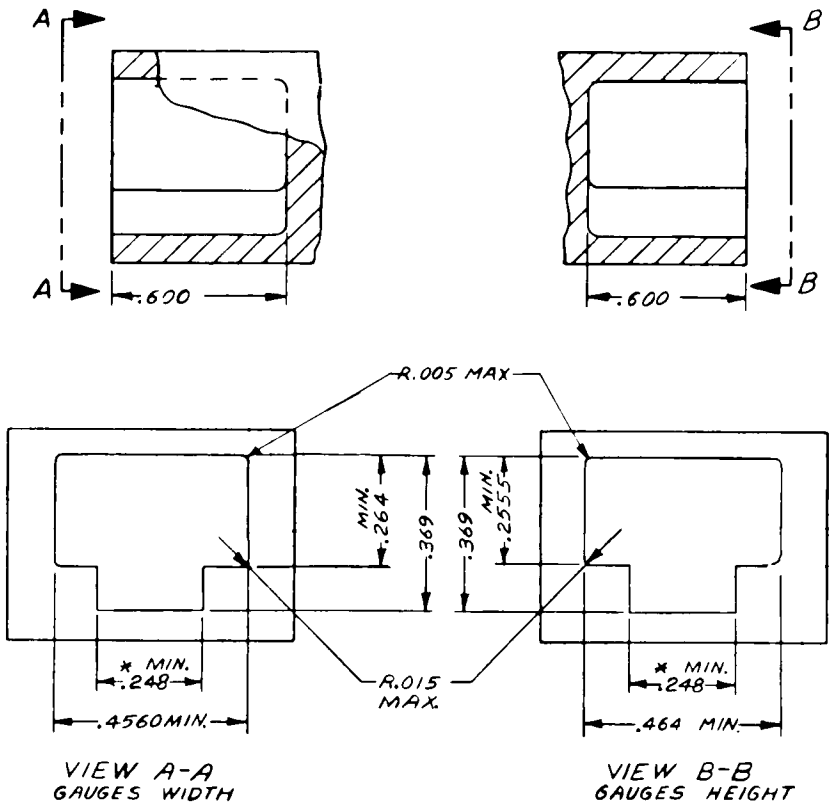
Notes:

1. The plug shall be capable of insertion and latching into the gauge with 5 pounds or less insertion force. Plug latching bar shall be depressed so as not to interfere with the plug entry. After insertion and latching, plug shall be capable of removal, with the latch depressed, with a removal force of 10 pounds or less applied at an advantageous angle.

2. Dimensions given to three decimal places shall be within ± .002 inch.

3. Dimensions (A) and (B) to be centrally located with respect to .4640 max. jack opening width within ± .001 inch.

4. Do not scale drawings for external configuration.



NO – GO GAUGE

1. The plug shall not be capable of entering the gauge more than .070-inch beyond datum –A– (see Figure 10 with 2.0 pounds insertion force.

2. Non-toleranced dimensions given to three places shall be within ± .002 inch.

3. * .248 dimension to be centrally located with respect to .464 minimum and .4560 minimum within ± .002 inch.

Figure 13

MINIATURE 8 POSITION STANDARD JACK

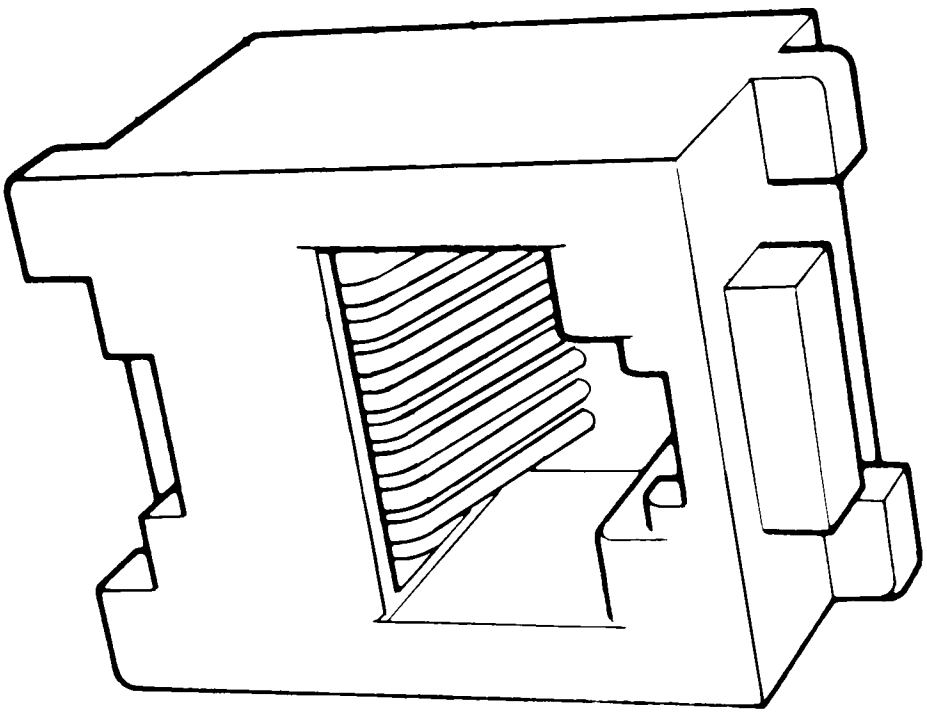
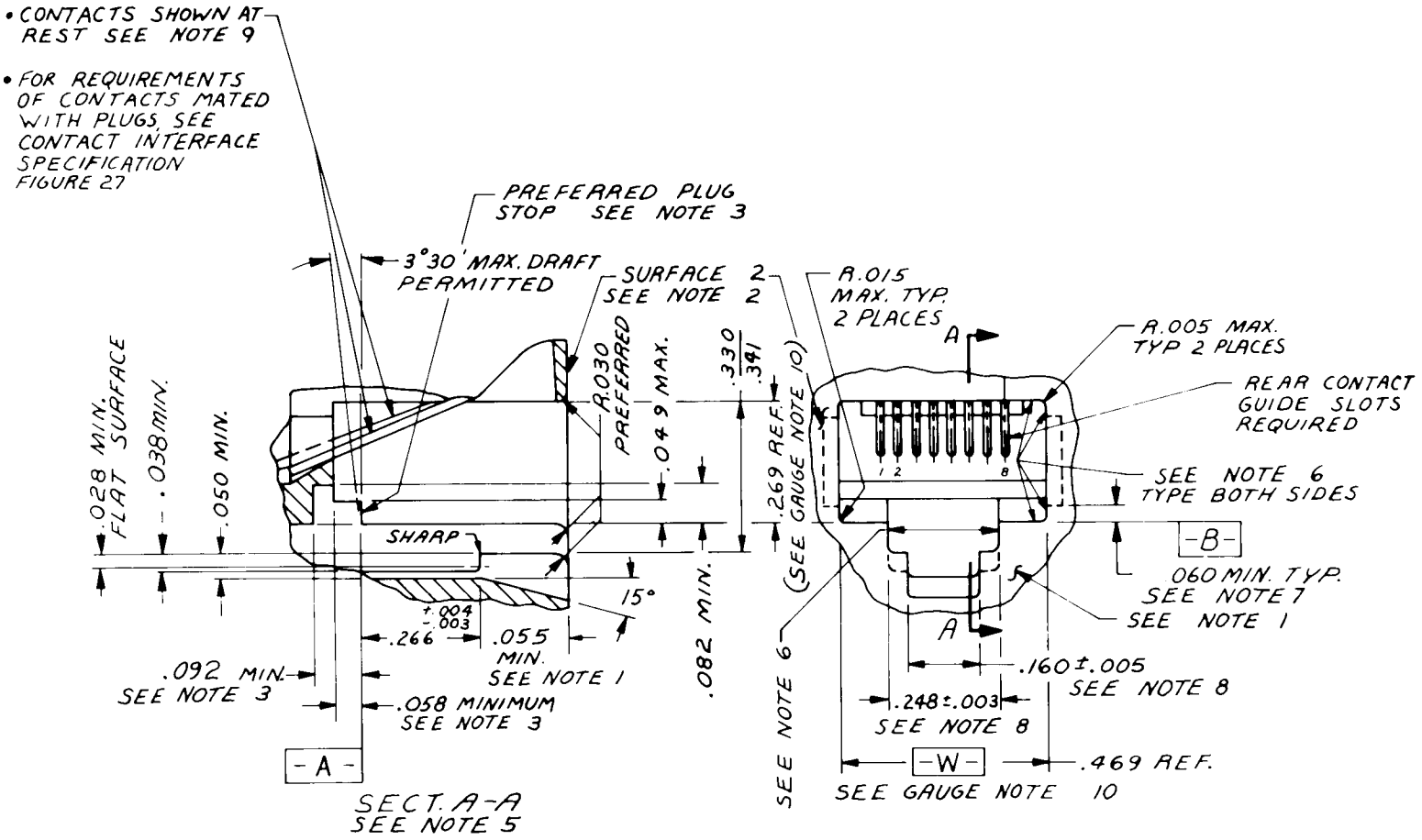


Figure 14

Note: This Jack Is Depicted With 8 Contacts. It May Be Fabricated With Less Than 8 Contacts.



NOTE: ALL NOTES FOLLOW FIGURE 16

Figure 15

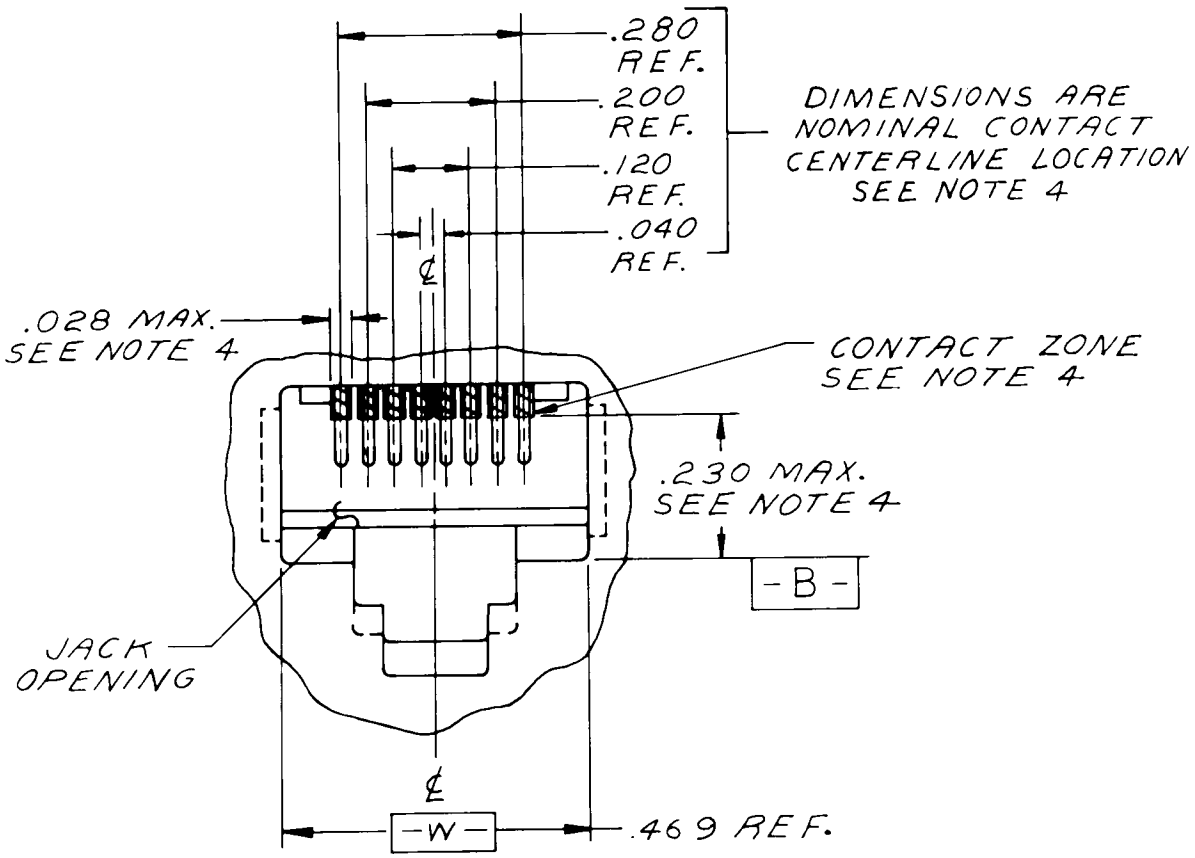


Figure 16

NOTE: ALL NOTES FOLLOW THIS FIGURE

8-POSITION JACK, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 15 & 16)

1. Front surface projections beyond the .055 minimum shall be configured so as not to prevent finger access to the plug release catch (Reference Figures 10 & 11, 8-Position Plug, Specifications). A catch length greater than .055 is beneficial in providing for greater breakout strength and improved guidance when interfacing with a 6-position plug.

2. Surface Z need not be planar or coincident with the surface under the plug release catch. Surface Z projections must not prevent insertion, latching, and unlatching of the standard 8-position plug on Figures 10 & 11.

3. The preferred plug stop surface is indicated. If some other internal feature is used as a plug stop, it must be located so that the axial movement of a latched plug is not greater than 0.045-inch.

4. To prevent mistargeting between the plug and jack contacts, the jack contacts should be completely contained in their individual contact zones (.028 inch max. wide) where they extend into the jack openings. There is no location requirement for jack contacts below these zones (.230 inch max.), but adequate contact separation must be maintained to prevent electrical breakdown. These shaded contact zones should be centrally located (include all locating tolerances) about the jack opening width .469 Ref. (Datum -W-). Contacts located outside of these zones may result in mistargeting between the jack and plug contacts.

5. All inside and outside corners in the plug cavity to be .015 inch radius max. unless specified.

6. These surfaces shall have $0^{o}15'$ maximum draft.

7. Relief inside the dotted areas on both sides of the jack opening is permitted. The .269 Ref. and .469 Ref. Gauge Requirements must be maintained in each of the corners indicated (Ref. 0.060 inch min.) to assure proper plug/jack interface guidance.

8. 0.160- and .248-inch dimensions to be centrally located to jack opening width -W- within ± 0.005-inch.

9. The contact lengths shall be such that the contacts will always be contained inside the guide slots, and the contacts must move freely in the slots so as not to restrain plug insertion or damage jack contacts.

8-POSITION KEYED JACK, SPECIFICATION NOTES

NOTES: (Continued)

10. Gauge Requirements:

GO: The jack shall be capable of accepting a 0.4640-inch X 0.2640-inch gauge and the gauge shall be capable of being removed with a maximum force of 2.0 pounds.

NO GO: The jack shall not accept either a 0.4740-inch X 0.254-inch horizontal width of opening gauge or a 0.2740-inch X 0.456-inch vertical height of opening gauge. However, if the gauge is accepted, the force necessary to remove the gauge shall be minimum 3.0 ounces.

Removal forces do not include forces contributed by contact springs nor shall external forces be applied to the jack that will affect these removal forces.

Gauges shall have a 0.030-inch radius on the nose and a 0.015-inch radius on all edges with clearance provided for contacts.

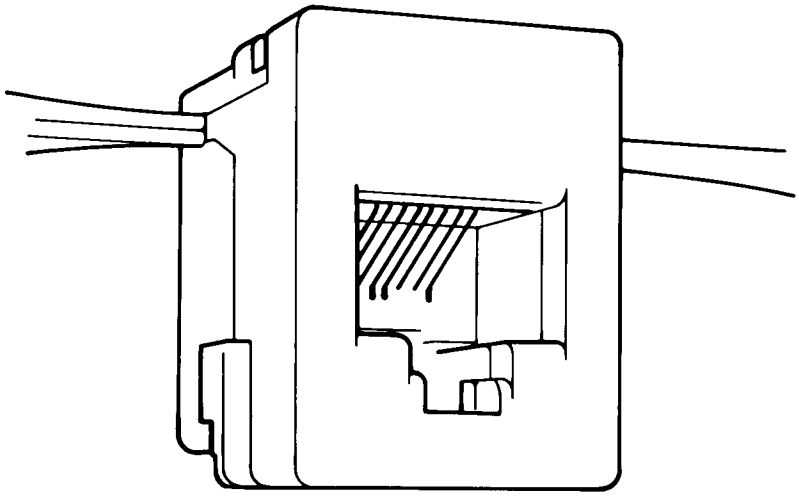
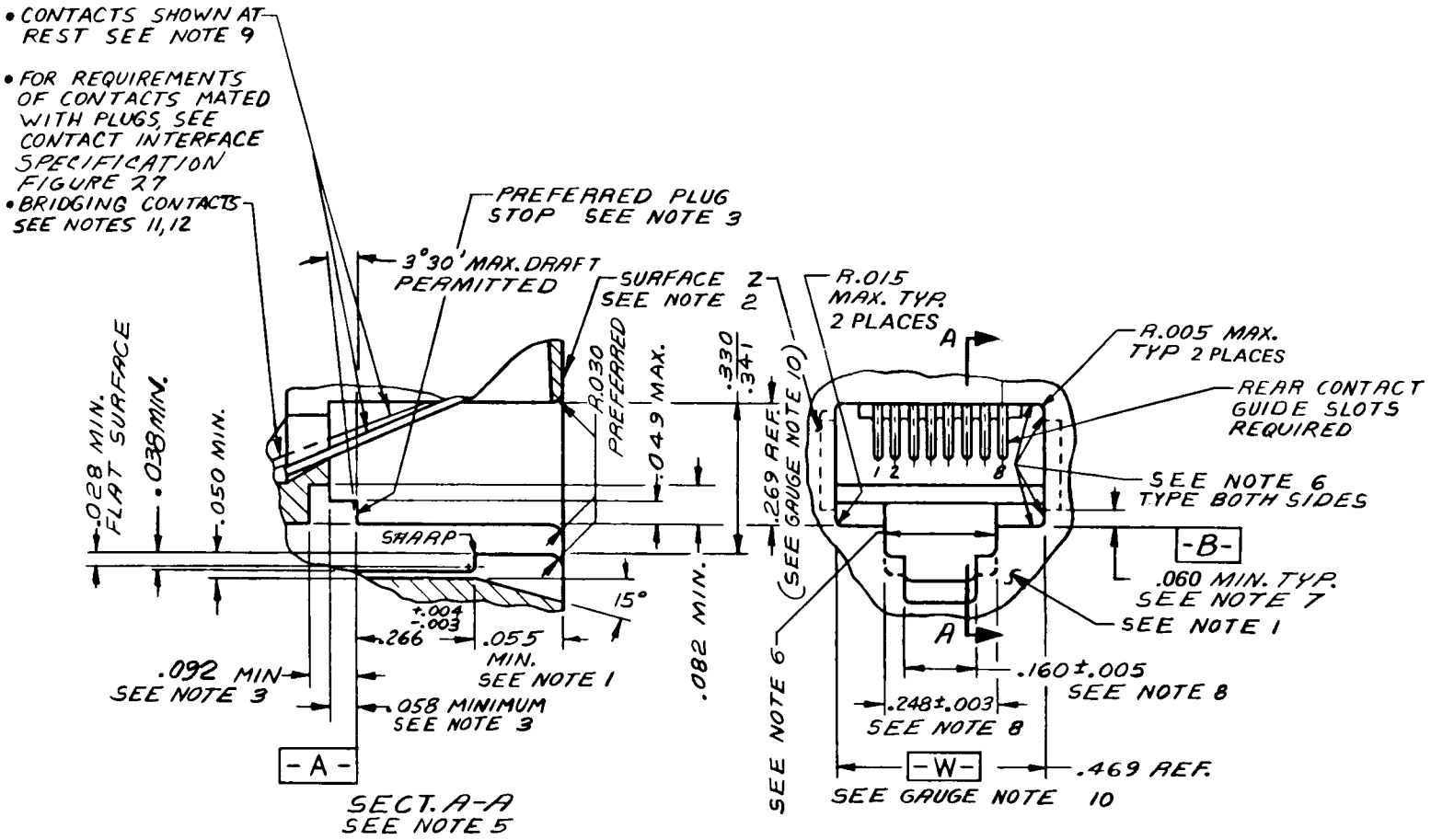


Figure 17

Note: This jack is depicted with 8 contacts. It may be fabricated with less than 8 contacts.



NOTE: ALL NOTES FOLLOW FIGURE 19

Figure 18

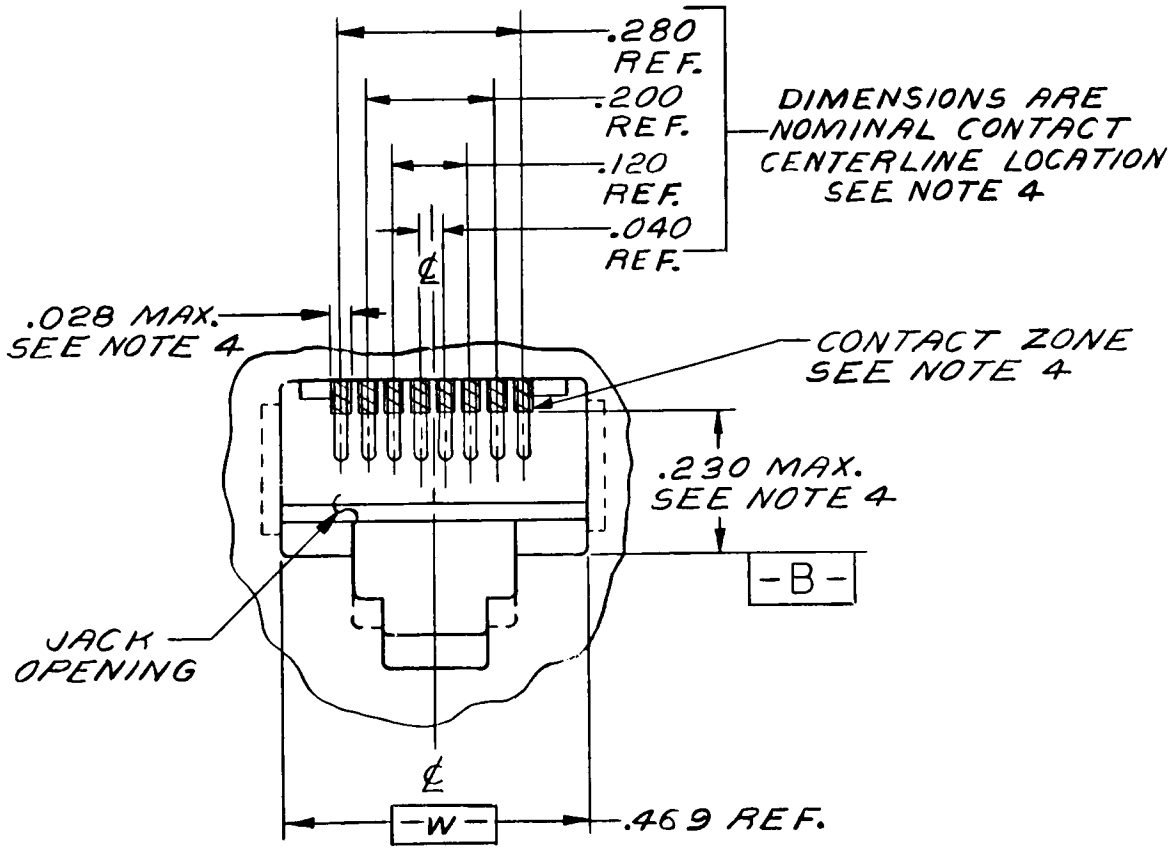


Figure 19

NOTE: ALL NOTES FOLLOW THIS FIGURE

8-POSITION SERIES JACK, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 18 & 19)

1. Front surface projections beyond the .055 minimum shall be configured so as not to prevent finger access to the plug release catch (Reference Figures 10 & 11, 8-Position Plug, Specifications). A catch length greater than .055 is beneficial in providing for greater breakout strength and improved guidance when interfacing with a 6-position plug.

2. Surface Z need not be planar or coincident with the surface under the plug release catch. Surface Z projections must not prevent insertion, latching, and unlatching of the standard 8-position plug on Figures 10 & 11.

3. The preferred plug stop surface is indicated. If some other internal feature is used as a plug stop, it must be located so that the axial movement of a latched plug is not greater than 0.045-inch.

4. To prevent mistargeting between the plug and jack contacts, the jack contacts should be completely contained in their individual contact zones (.028 inch max. wide) where they extend into the jack openings. There is no location requirement for jack contacts below these zones (.230 inch max.), but adequate contact separation must be maintained to prevent electrical breakdown. These shaded contact zones should be centrally located (include all locating tolerances) about the jack opening width .469 Ref. (Datum -W-). Contacts located outside of these zones may result in mistargeting between the jack and plug contacts.

5. All inside and outside corners in the plug cavity to be .015 inch radius max. unless specified.

6. These surfaces shall have $0^{o}15'$ maximum draft.

7. Relief inside the dotted areas on both sides of the jack opening is permitted. The .269 Ref. and .469 Ref. Gauge Requirements must be maintained in each of the corners indicated (Ref. 0.060 inch min.) to assure proper plug/jack interface guidance.

8. 0.160- and 0.248-inch dimensions to be centrally located to jack opening width -W- within $\pm$ 0.005-inch.

9. The contact lengths shall be such that the contacts will always be contained inside the guide slots, and the contacts must move freely in the slots so as not to restrain plug insertion or damage jack contacts.

8-POSITION SERIES JACK, SPECIFICATION NOTES

NOTES: (Continued)

10. Gauge Requirements:

GO: The jack shall be capable of accepting a 0.4640-inch X 0.2640-inch gauge and the gauge shall be capable of being removed with a maximum force of 2.0 pounds.

NO GO: The jack shall not accept either a 0.4740-inch X 0.254-inch horizontal width of opening gauge or a 0.2740-inch X 0.456-inch vertical height of opening gauge. However, if the gauge is accepted, the force necessary to remove the gauge shall be minimum 3.0 ounces.

Removal forces do not include forces contributed by contact springs nor shall external forces be applied to the jack that will affect these removal forces.

Gauges shall have a 0.030-inch radius on the nose and a 0.015-inch radius on all edges with clearance provided for contacts.

(c) Miniature 8–position keyed plug:

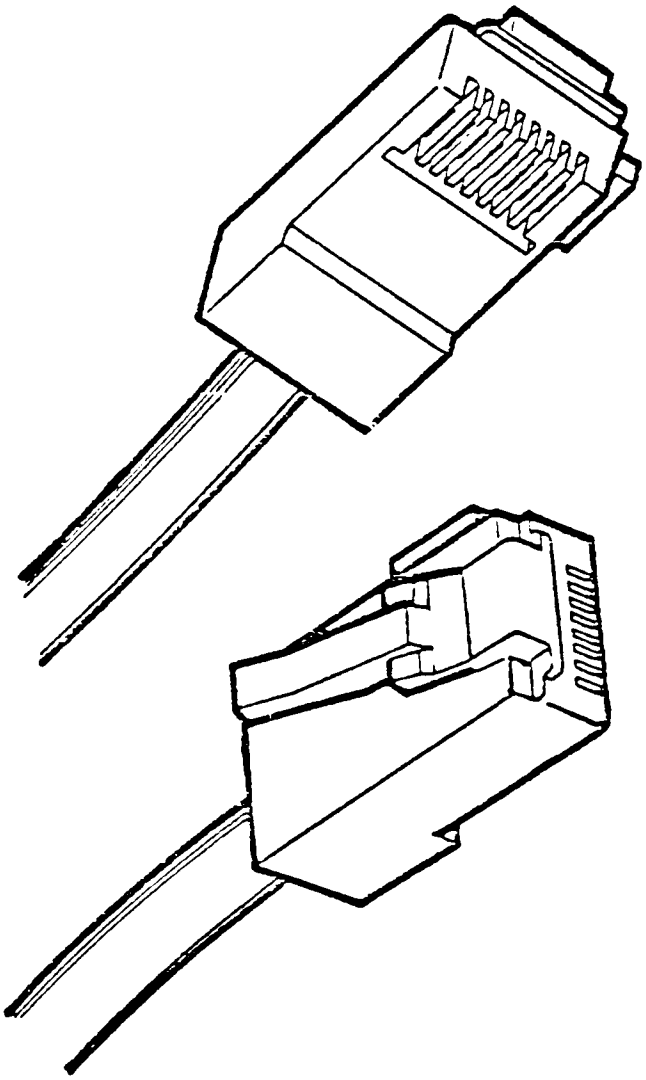
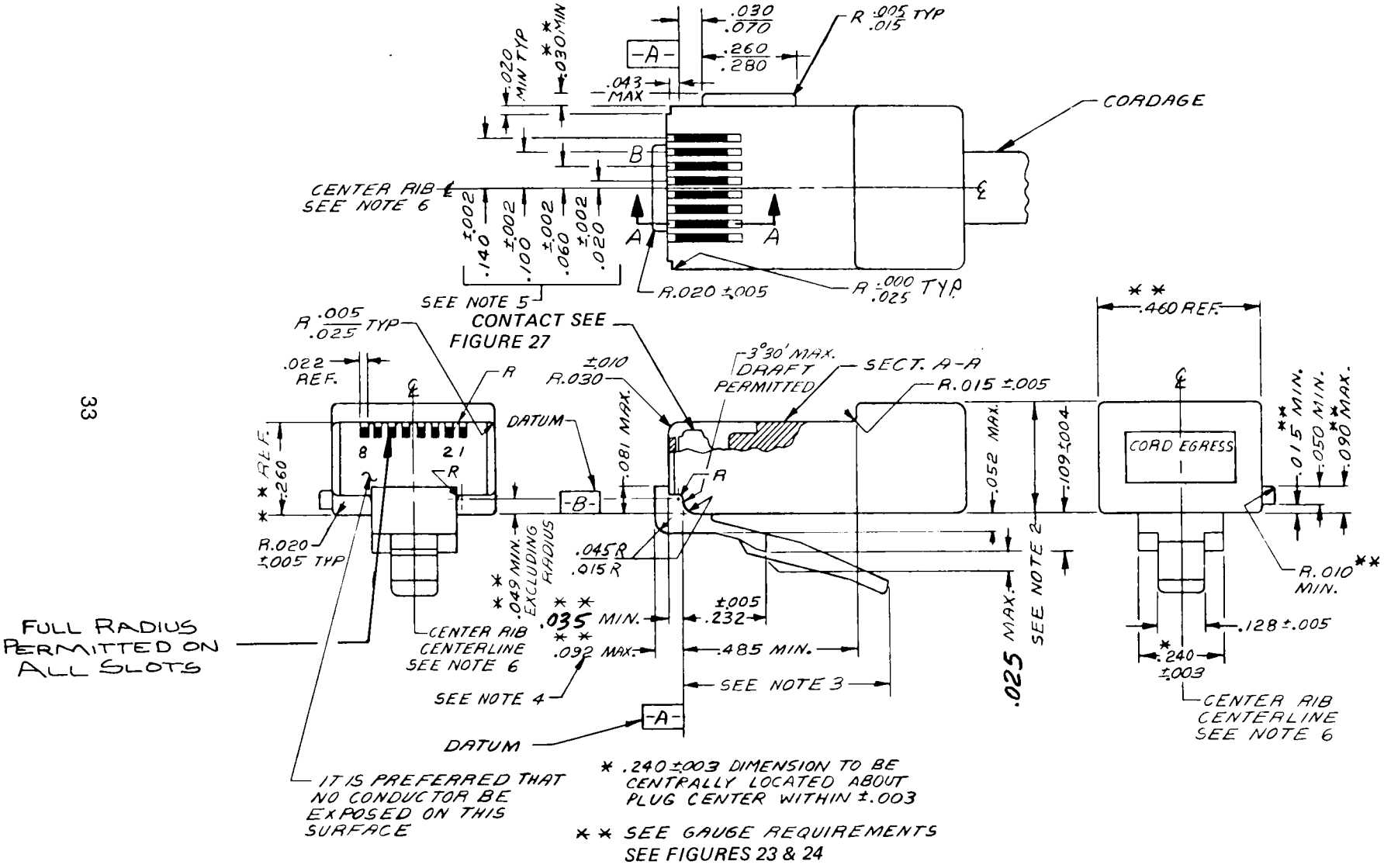


Figure 20

Note: This plug is depicted with its full 8 contact capacity.
It may be fabricated with less than 8 contacts.



NOTE: ALL NOTES FOLLOW FIGURE 22

Figure 21

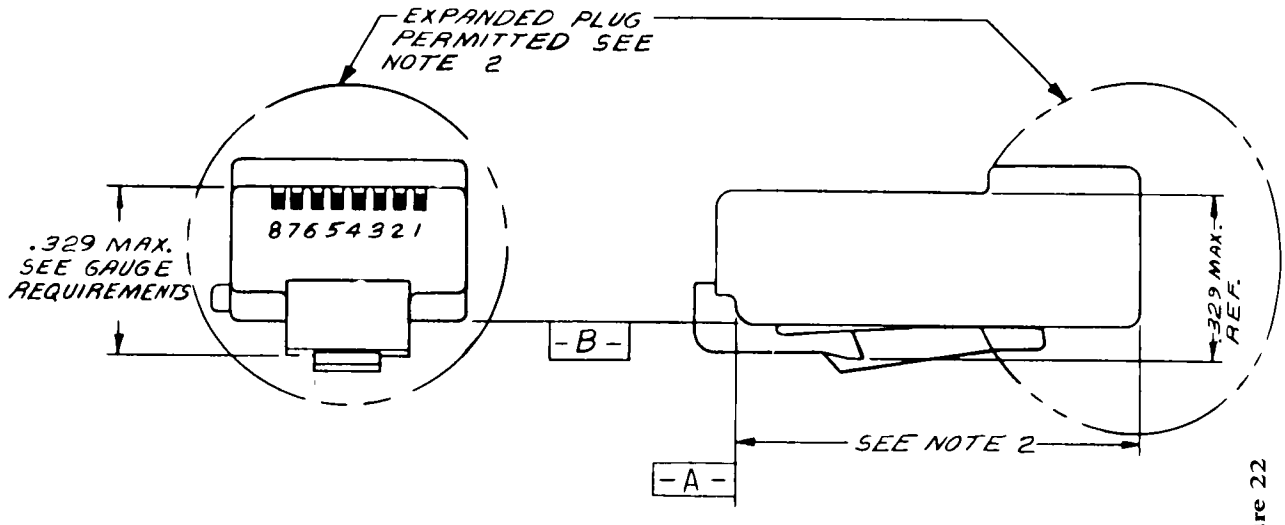


Figure 22

NOTE: ALL NOTES FOLLOW THIS FIGURE

8-POSITION KEYED PLUG, SPECIFICATION NOTES

NOTES: (Notes apply to Figures 21 & 22)

1. All plugs must be capable of meeting the requirements of the plug go and no-go gauges.

2. The standard plug height in the area shown in .315 inch maximum. The standard plug length is .910 inch maximum. Plugs may be made longer than standard or adapted for direct use on special cords, adapters without cordage, apparatus or equipment subject to the limitations described in the general paragraph of this document. Plugs longer and/or higher than standard may inhibit the special features of some network jack enclosures.

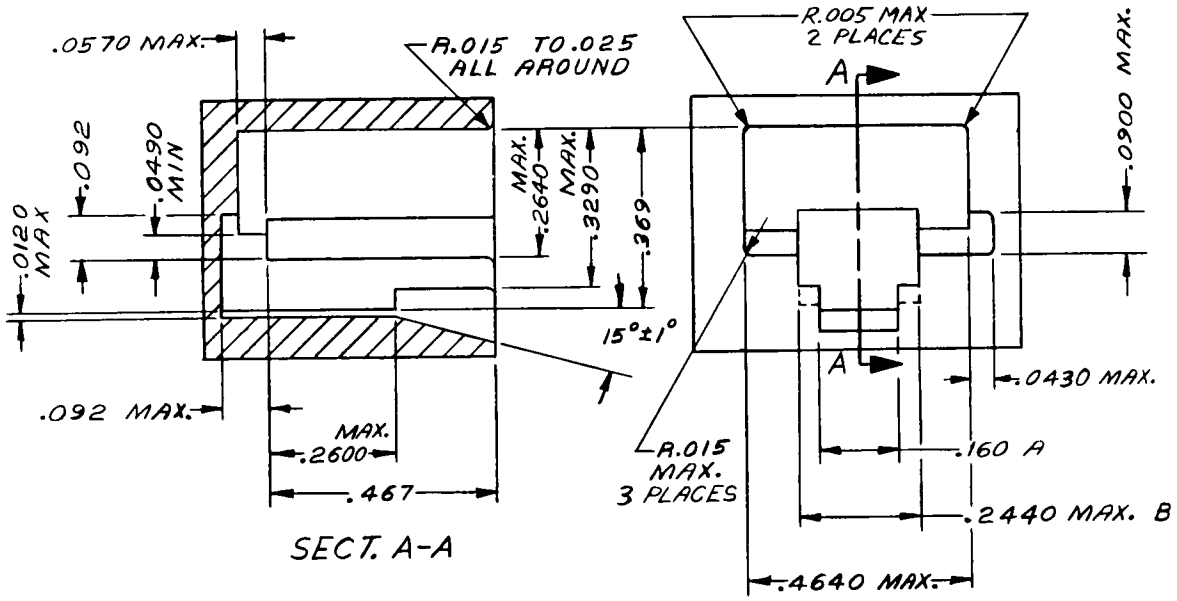
3. A .575 inch minimum tab length is required. It is preferred that a maximum tab length be no longer than .625 inch. Longer tabs may be used with the same limitations as described in Note 2.

4. To obtain maximum plug guidance in jacks, it is desirable to extend the front plug nose to the .092 inch maximum.

5. These dimensions apply to the location of jack contact receiving slots. It is desirable that plug contacts be centered axially in these slots, but centering is not required.

6. The center rib centerline shall be coincident with the plug width (.460 Ref.) centerline within $\pm$ .003 inch.

MINIATURE 8 POSITION KEYED PLUG, MAXIMUM PLUG SIZE



GO GAUGE

Figure 23

Notes:

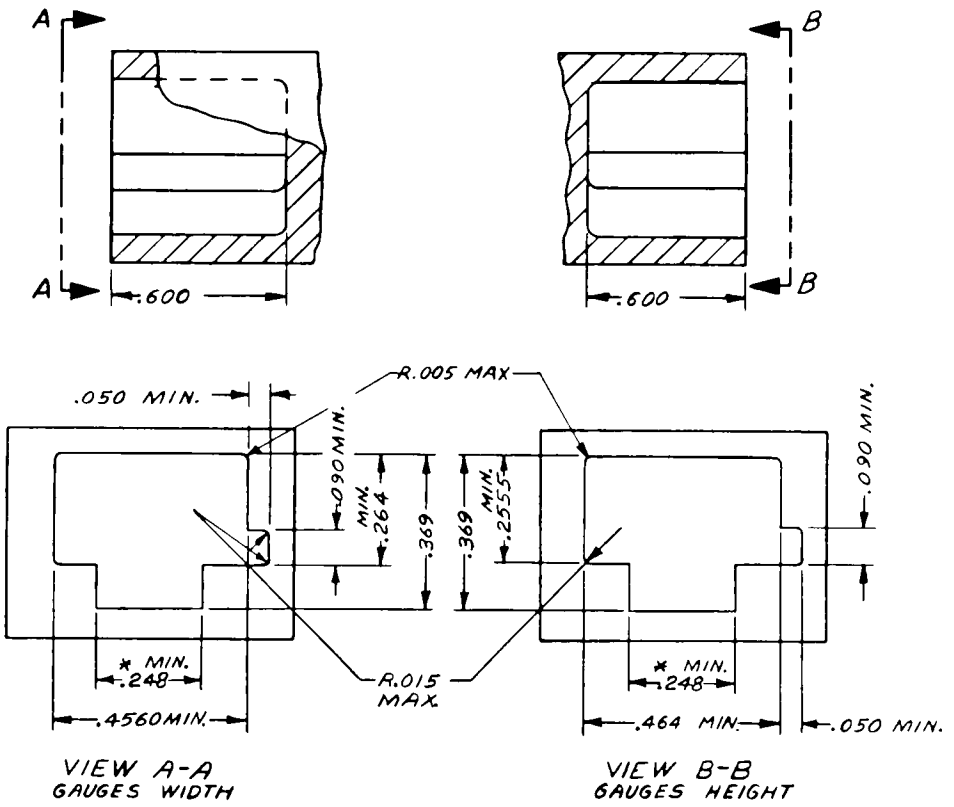
1. The plug shall be capable of insertion and latching into the gauge with 5 pounds or less insertion force. Plug latching bar shall be depressed so as not to interfere with the plug entry. After insertion and latching, plug shall be capable of removal, with the latch depressed, with a removal force of 10 pounds or less applied at an advantageous angle.

2. Dimensions given to three decimal places shall be within ± .002 inch.

3. Dimensions (A) and (B) to be centrally located with respect to .4640 max. jack opening width within ± .001 inch.

4. Do not scale drawings for external configuration.

MINIATURE 8 POSITION KEYED PLUG, MINIMUM PLUG SIZE



NO – GO GAUGE

1. The plug shall not be capable of entering the gauge more than .070-inch beyond datum –A– (see Figure 21 with 2.0 pounds insertion force.

2. Non-toleranced dimensions given to three places shall be within ± .002 inch.

3. * .248 dimension to be centrally located with respect to .464 minimum and .4560 minimum within ± .002 inch.

Figure 24

MINIATURE 8 POSITION KEYED JACK

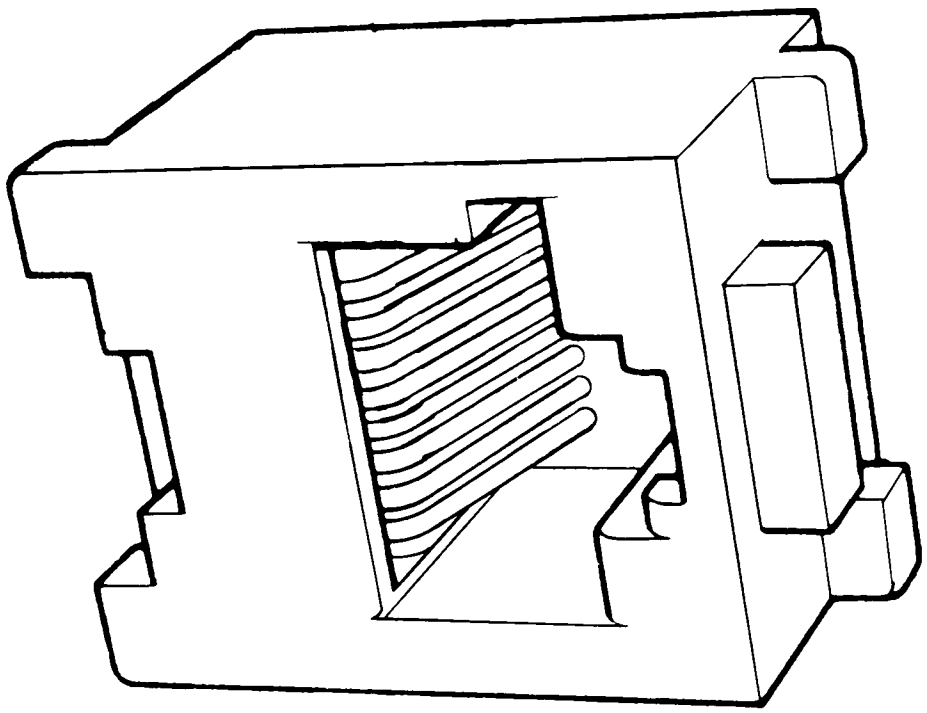
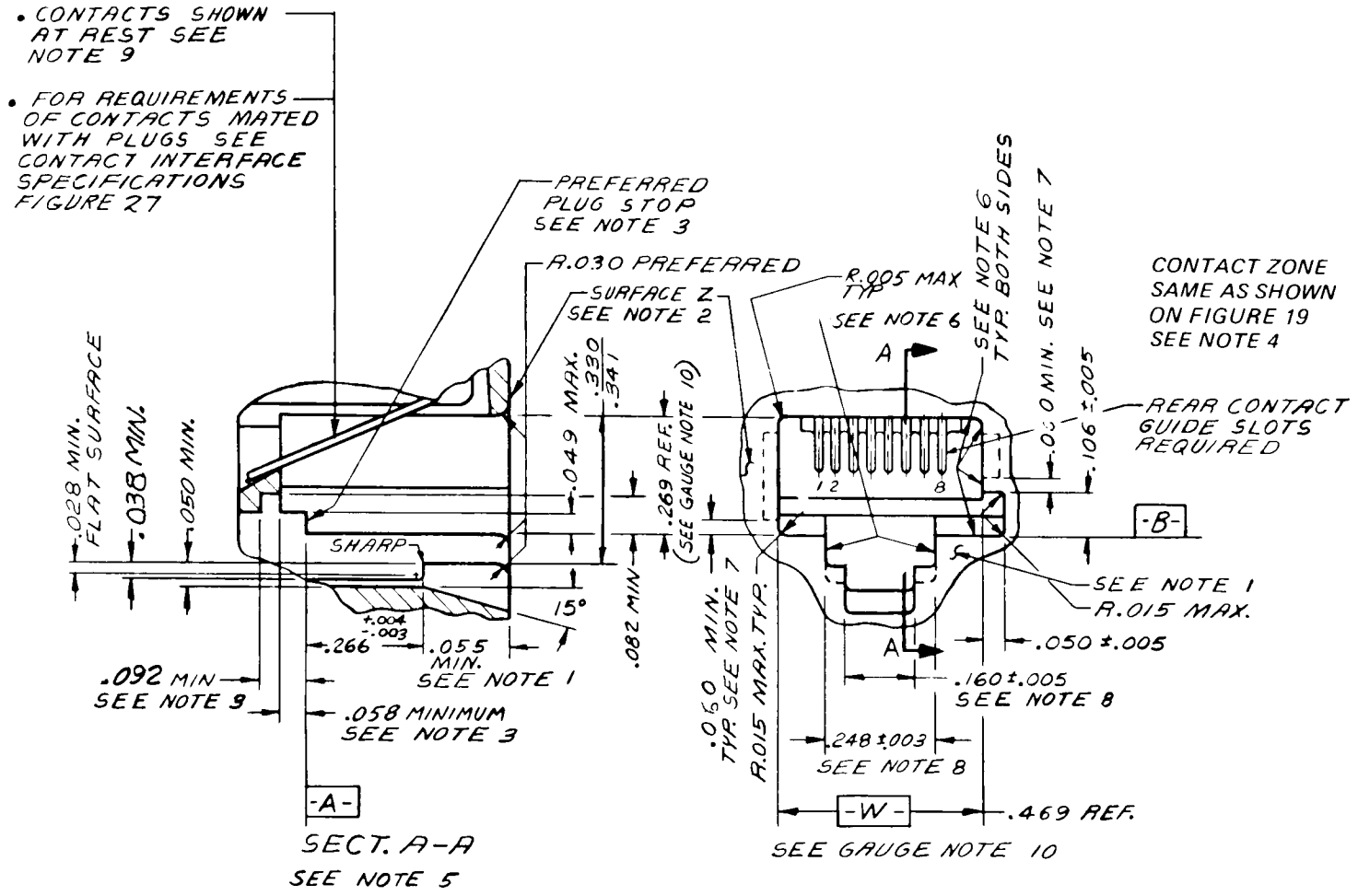


Figure 25

Note: This jack is depicted with all 8 contacts. It may be fabricated with less than 8 contacts.



NOTE: ALL NOTES FOLLOW THIS FIGURE

Figure 26

8-POSITION KEYED JACK, SPECIFICATION NOTES

NOTES: (Notes apply to Figure 26)

1. Front surface projections beyond the .055 minimum shall be configured so as not to prevent finger access to the plug release catch (Reference Figures 21 & 22). A catch length greater than .055 is beneficial in providing for greater breakout strength and improved guidance when interfacing with a 6-position plug.

2. Surface Z need not be planar or coincident with the surface under the plug release catch. Surface Z projections must not prevent insertion, latching, and unlatching of the standard 8-position plug on Figures 21 & 22.

3. The preferred plug stop surface is indicated. If some other internal feature is used as a plug stop, it must be located so that the axial movement of a latched plug is not greater than 0.045-inch.

4. To prevent mistargeting between the plug and jack contacts, the jack contacts should be completely contained in their individual contact zones (.028 inch max. wide) where they extend into the jack openings. There is no location requirement for jack contacts below these zones (.230 inch max.), but adequate contact separation must be maintained to prevent electrical breakdown. These shaded contact zones should be centrally located (include all locating tolerances) about the jack opening width .469 Ref. (Datum -W-). Contacts located outside of these zones may result in mistargeting between the jack and plug contacts.

5. All inside and outside corners in the plug cavity to be .015 inch radius max. unless specified.

6. These surfaces shall have $0^{o}15'$ maximum draft.

7. Relief inside the dotted areas on both sides of the jack opening is permitted. The .269 Ref. and .469 Ref. Gauge Requirements must be maintained in each of the corners indicated (Ref. 0.060 inch min.) to assure proper plug/jack interface guidance.

8. 0.160- and .248-inch dimensions to be centrally located to jack opening width -W- within $\pm$ 0.005-inch.

9. The contact lengths shall be such that the contacts will always be contained inside the guide slots, and the contacts must move freely in the slots so as not to restrain plug insertion or damage jack contacts.

8-POSITION KEYED JACK, SPECIFICATION NOTES

NOTES: (Continued)

10. Gauge Requirements:

GO: The jack shall be capable of accepting a 0.4640-inch X 0.2640-inch gauge and the gauge shall be capable of being removed with a maximum force of 2.0 pounds.

NO GO: The jack shall not accept either a 0.4740-inch X 0.254-inch horizontal width of opening gauge or a 0.2740-inch X 0.456-inch vertical height of opening gauge. However, if the gauge is accepted, the force necessary to remove the gauge shall be minimum 3.0 ounces.

Removal forces do not include forces contributed by contact springs nor shall external forces be applied to the jack that will affect these removal forces.

Gauges shall have a 0.030-inch radius on the nose and a 0.015-inch radius on all edges with clearance provided for contacts.

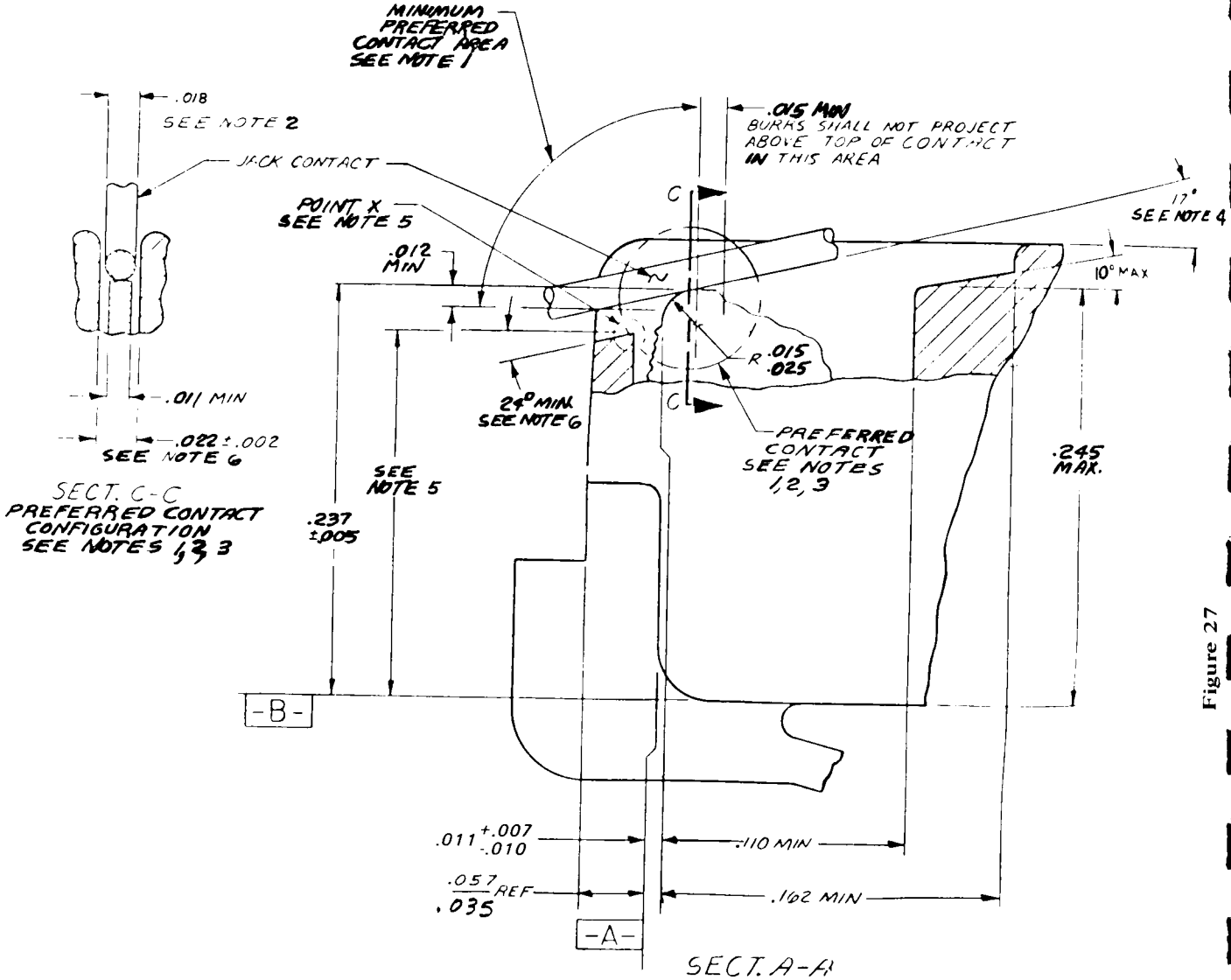


Figure 27

NOTE: ALL NOTES FOLLOW THIS FIGURE

PLUG/JACK CONTACT SPECIFICATION NOTES

NOTES: (Notes apply to Figures 2, 3, 10, 11, 21 & 22)

1. The plug/jack contact interface should be hard gold to hard gold and should have a minimum gold thickness of 0.000050 inch on each side of the interface. The minimum contact force should be 100 grams. Any non-gold contact material must be compatible with gold and provide equivalent contact performance. A smooth, burr-free surface is required at the interface in the area shown.

2. The jack contact design is based upon .018 inch spring temper phospher bronze round wire in the modular plug blade and jack contact interface. Other contact configurations that provide contact performance equal to or better than the preferred configurations and do not cause damage to the plug or jack are permitted. The preferred jack contact width is .0177/.0195 inches. Deviations from the preferred jack contact width are permitted for round contacts as well as noncircular cross sectional shapes but they must be compatible with existing plug configurations. The requirements of Note 1 apply to all possible contact areas.

3. The configuration of the plug contact and the front plastic of the plug should prevent jack contacts from being damaged during plug insertion into jacks.

4. This is the suggested nominal contact angle between plugs and jacks with the plug latched into the jack. If this angle becomes greater than 24 degrees, loss of electrical contact may occur between the plug and jack. If the nominal contact angle becomes less than 13 degrees, interference between jack contacts and the internal plastic in the plug may occur.

5. To avoid loss of electrical contact, the preferred dimension from datum B to the highest point "x" should be .200 inch max. A dimension greater than .211 inch may result in loss of electrical contact between plugs and jacks. The .211 inch max. shall be considered an absolute maximum.

6. The 24 degree min. angle applies only to plugs with front plastic walls higher than .190 inches.

PUB 47102

ADDENDUM 1

(ISSUE 2)

TECHNICAL DESCRIPTION

MINIATURE PLUGS AND JACKS

BELL SYSTEM

MODULAR CONNECTING BLOCKS AND ADAPTERS

FOR VOICE AND PERMISSIVE DATA EQUIPMENT

December, 1982

DIRECTOR - DISTRIBUTION SERVICES, INSTALLATION & MAINTENANCE

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ADDENDUM

TECHNICAL DESCRIPTION

BELL SYSTEM MODULAR CONNECTING BLOCK AND PLUG FOR VOICE AND PERMISSIVE DATA EQUIPMENT

TABLE OF CONTENTS

TABLES

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

BELL SYSTEM MODULAR CONNECTING BLOCKS AND ADAPTERS FOR VOICE AND PERMISSIVE DATA EQUIPMENT

2.1 Introduction

The purpose of this Addendum is to provide certain additional dimensional information on the standard Bell System modular connecting blocks used for the Uniform Service Order Codes (USOCs) associated with voice or permissive (-9 dBm) data equipment. This document supplements the information contained in Appendix 1 Issue 1 "Technical Description Miniature Plugs and JAcks" dated August 1980, by providing dimensional information which describes those features of the Bell System mountings that surround and in some cases cover the standard modular jacks. This information is provided for those designers or manufacturers of communication equipment who plan to affix miniature modular plugs directly to their equipment or apparatus without line cords and are concerned with interfacing with the Bell System hardware used to mount the standard jacks.

The American Telephone and Telegraph Company reserves the right to make whatever changes it deems necessary in the dimensions, tolerances, and requirements of the connecting blocks and adapters as covered in this Addendum, and in the associated product in manufacture. Such changes may be necessary for any reason, including, but not limited to, ongoing technological or operational innovations that may be required to meet manufacturing and/or operating environment conditions.

Pictures of each of the connecting blocks are provided to assist in visualizing the physical appearance of the hardware. Table A provides a description of each of the connecting blocks and adapters and a list of the applicable USOCs.

The electrical wiring arrangements for the apparatus illustrated are not provided in this document. This information is available in Technical Reference PUB 47101 titled "Bell System Voice and Data Communications Technical Reference — Standard Plugs and Jacks."

It should be noted that this Addendum describes the modular connecting apparatus standardized for use in the Bell System for voice and permissive data equipment. The Bell Operating Companies at their own discretion may be using other connecting apparatus to provide the USOCs discussed.

TABLE A

CONNECTING BLOCKS AND ADAPTERS — DESCRIPTION AND APPLICABLE USOCS

Connecting Block or Adapter	Description	USOC
625A, 725A Connecting Blocks	Surface Mounted — Bridged Tip and Ring. See Figures 1A and 2A	RJ11C, RJ12C, RJ13C, RJ14C, and RJ16X
625D6 Connecting Block	Flush Mounting — Dual Jack Outlet for Dual Telephone or Ancillary Device. All six pin positions in each jack are wired — Bridged Tip and Ring. See Figures 15A and 16A.	No USOC Assigned
625F, 725F Connecting Blocks	Flush Mounted — Bridged Tip and Ring. See Figures 3A and 4A.	RJ11C, RJ12C, RJ13C, RJ14C, and RJ16X
625S, 625SA, 625TD, 625TD2, 725S Connecting Blocks	Surface Mounted with protective rotating cover — Bridged Tip and Ring. See Figures 5A and 6A.	RJ11C, RJ12C, RJ13C, RJ14C, RJ16X, and RJ25C
625FS, 725FS, 725FSA Connecting Blocks	Flush Mounted with protective rotating cover — Bridged Tip and Ring. See Figures 7A and 8A.	RJ11C, RJ12C, RJ13C, RJ14C, and RJ16X
625H Connecting Block	Flush Mounted — Bridged Tip and Ring on jack positions 1 and 6 — for use in hospital critical care areas with equipment conforming to Article 517 of the 1981 National Electrical Code. See Figures 9A and 10A.	RJ17C
625WP4 Connecting Block	Outdoor Mounting — Bridged Tip and Ring. See Figures 17A and 18A.	RJ11C, RJ12C, RJ13C, RJ14C, and RJ16X
630A, 630B, 730A, 730B, 830A4 Connecting Blocks	Surface Mounted — for use with Modular wall telephone sets — Bridged Tip and Ring. See Figures 11A and 12A.	RJ11W, RJ12W, RJ13W, and RJ14W

TABLE A (CONTINUED)

Connecting Block or Adapter	Description	USOC
635B Connecting Block	Surface Mounted — for use with series connected equipment such as exclusion sets, alarm dialers, and automatic dialers. The equipment is placed in series with the telephone line and other station sets when it is connected with an 8-position modular plug. See Figures 13A and 14A.	RJ31X, RJ32X, RJ33X, RJ34X, RJ35X, RJ36X, RJ37X, and RJ38X*
74D Connecting Blocks (Manufactured) Discontinued) 625S6 Connecting Block	Surface Mounted — Modular jack is wired in all 6-Pin positions — Bridged Tip and Ring. See Figures 19A, and 20A. See Figures 5A and 6A.	RJ18C*, RJ19C*, and RJ25C
224A Adapter	Used to adapt a modular telephone set or ancilliary device (up to six positions) to a 12-pin non-Modular jack — Bridged Tip and Ring. See Figures 24A, 25A, and 26A.	RJA3X
225A Adapter	Used to adapt a modular telephone set or ancilliary device to a 4-pin non-modular jack — Bridged Tip and Ring. See Figures 21A, 22A, and 23A.	RJA1X
267A "T" Adapter	Tee adapter used to adapt a single modular jack to two Modular jacks — provides a bridged connection to the telephone line in both jacks. See Figures 27A and 28A.	RJA2X
1A Converter	Used to permanently convert a 4-pin non-modular jack to a 4-position modular jack — Bridged Tip and Ring. See Figures 29A, 30A, and 31A.	RJA1X

*Subject to effective Tariffs and/or rulemaking.

625A AND 725A CONNECTING BLOCKS

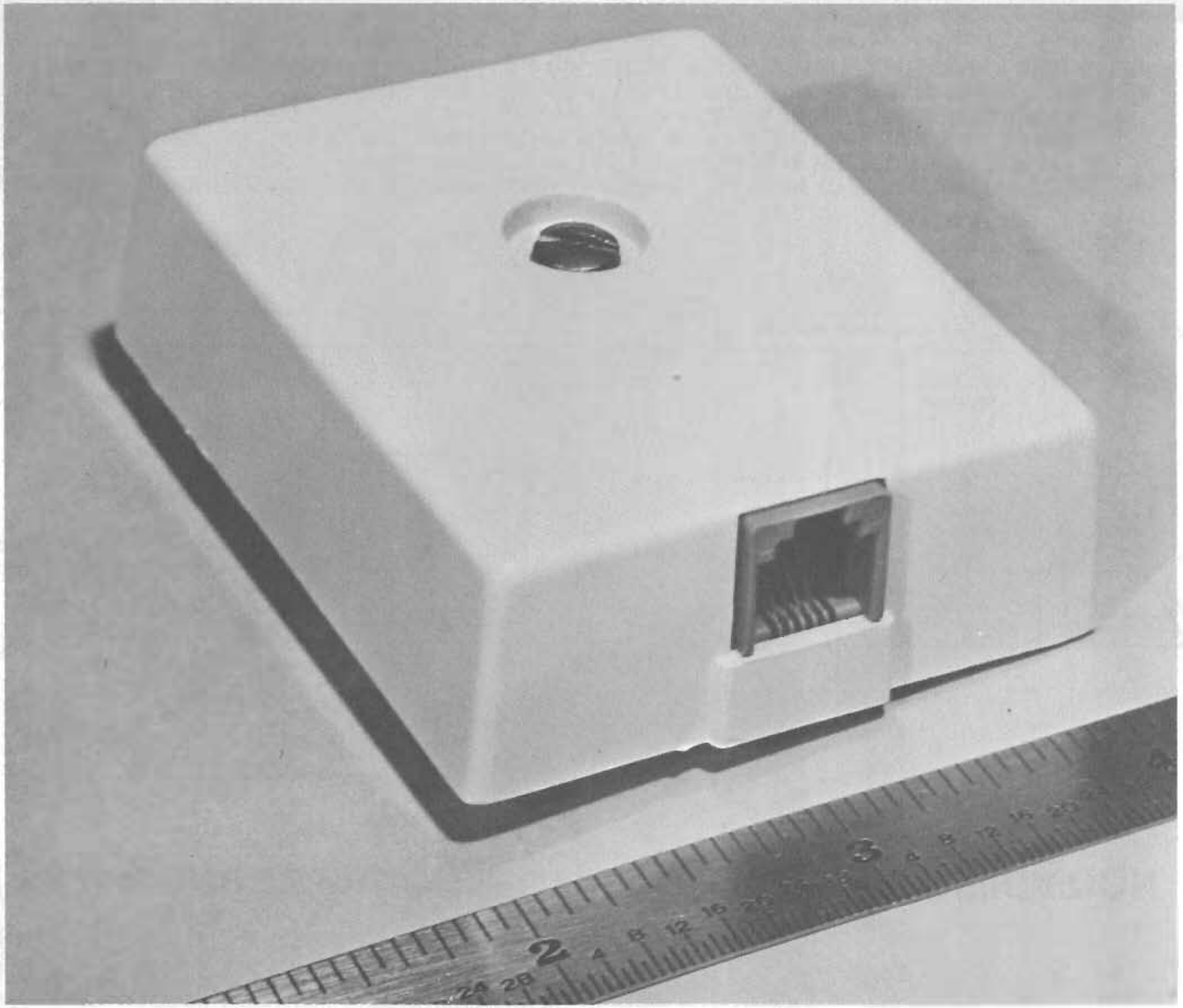
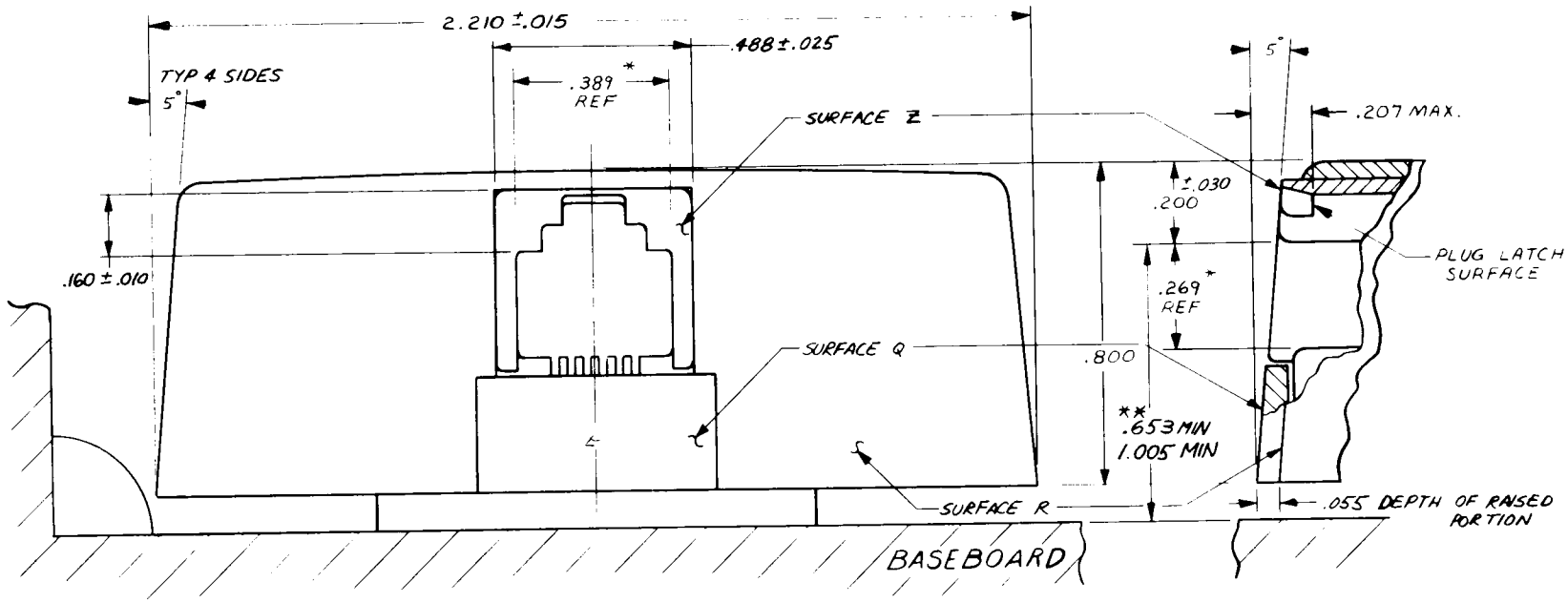


FIGURE 1A

625A AND 725A CONNECTING BLOCK - SPECIFICATION



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. **.653 MINIMUM DIMENSION APPLIES TO THE 625A MOUNTED ON A 42A BLOCK AND THE 1.005 MINIMUM DIMENSION APPLIES TO THE 725A MOUNTED ON A 42D BLOCK.

FIGURE 2A

625F AND 725F CONNECTING BLOCKS WITH ROUND AND RECTANGULAR FACEPLATES

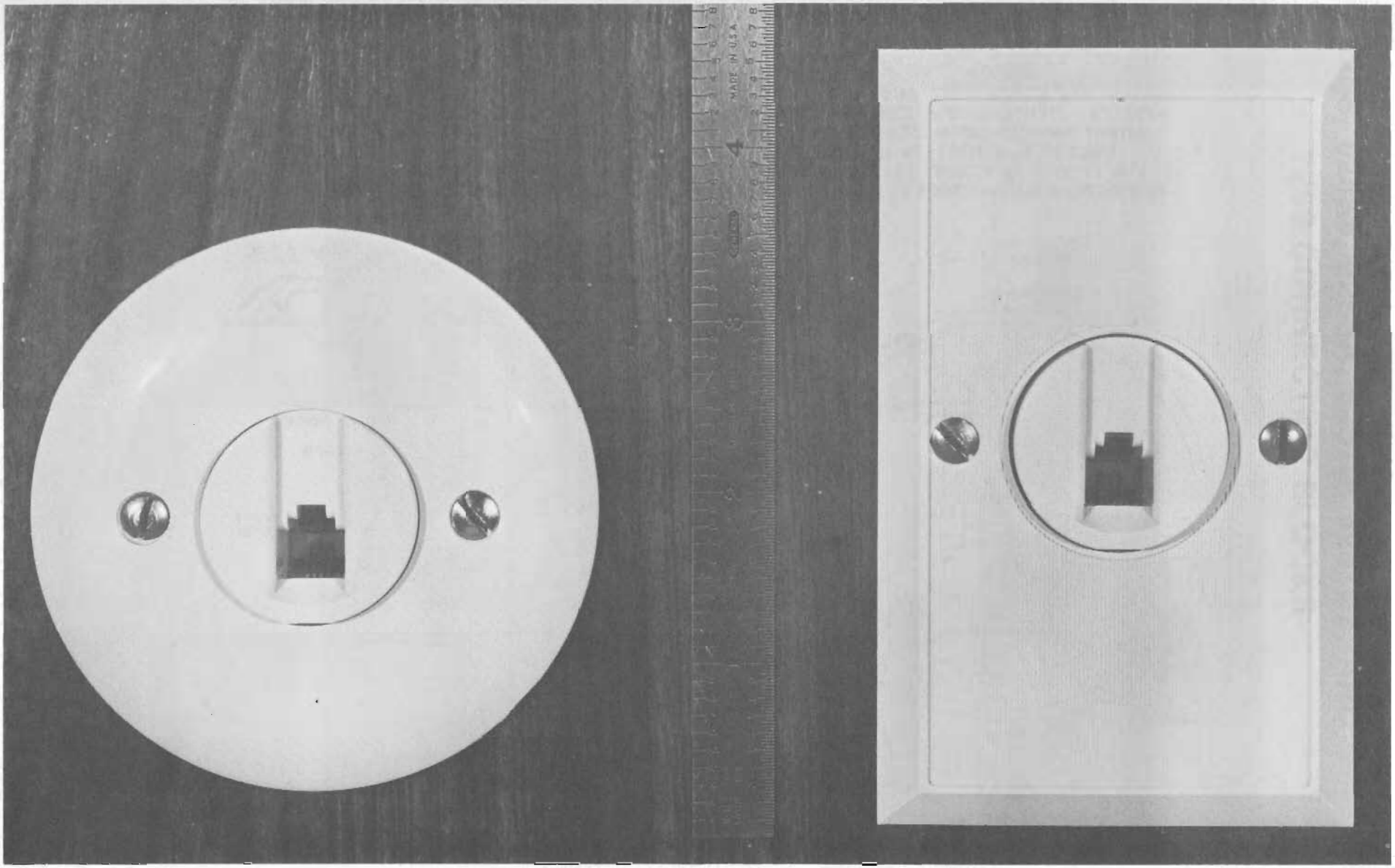
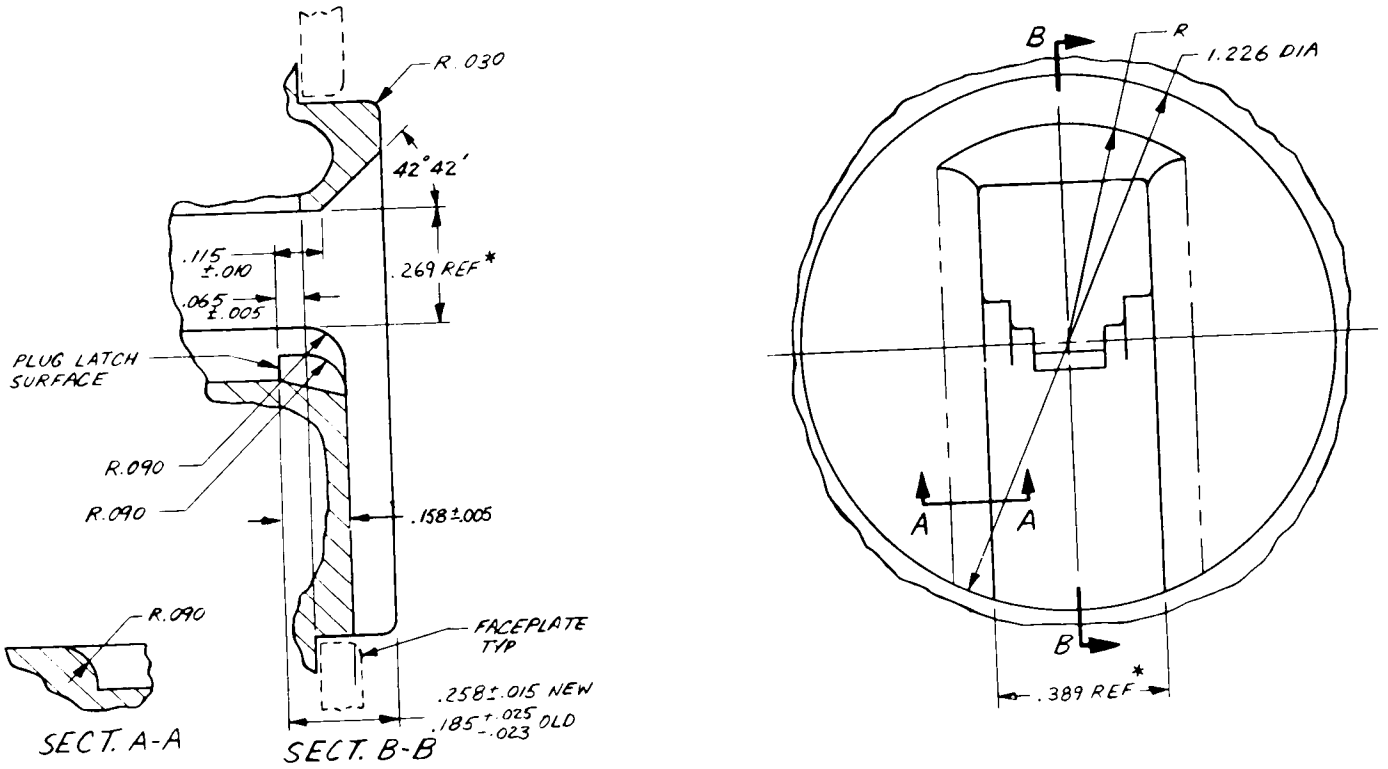


FIGURE 3A

625F AND 725F CONNECTING BLOCK - SPECIFICATION



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. **NEW DIMENSION APPLIES TO PRODUCT MANUFACTURED AFTER JULY, 1978

FIGURE 4A

625S, 625S6, 625SA, 625TD, 625TD2, AND 725S CONNECTING BLOCKS

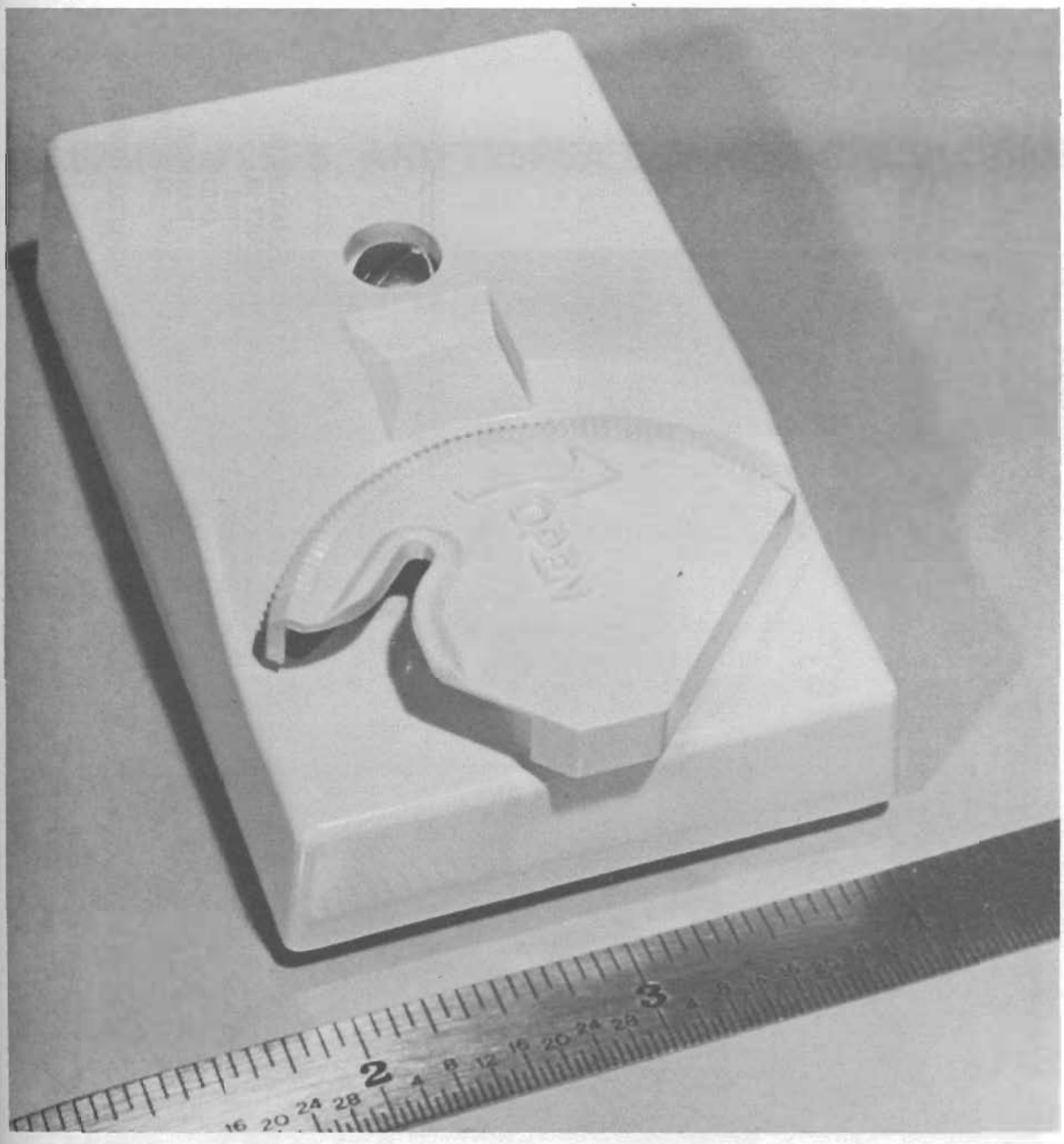
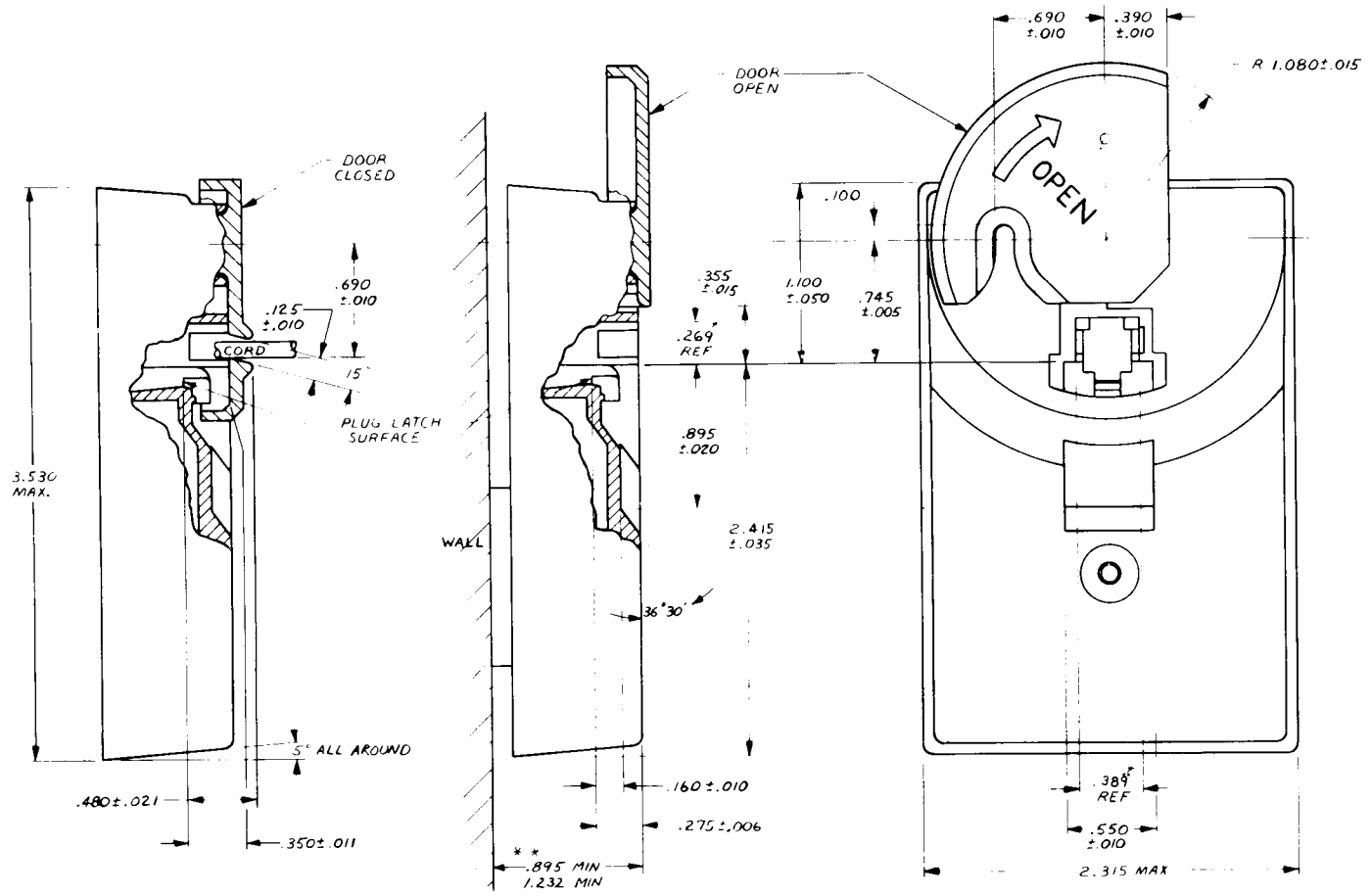


FIGURE 5A

625S, 625S6, 625SA, 625TD, 625TD2, AND 725S CONNECTING BLOCK



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. **.895 MINIMUM DIMENSION APPLIES TO THE 625S MOUNTED ON A 42A BLOCK AND THE 1.232 MINIMUM DIMENSION APPLIES TO THE 725S, 625TD, 625TD2, 625SA, AND 625S6 MOUNTED ON ANY OF THE FOLLOWING BASES (42B4, 42B6, OR 42E).

FIGURE 6A

625FS, 725FS, AND 725FSA CONNECTING BLOCKS

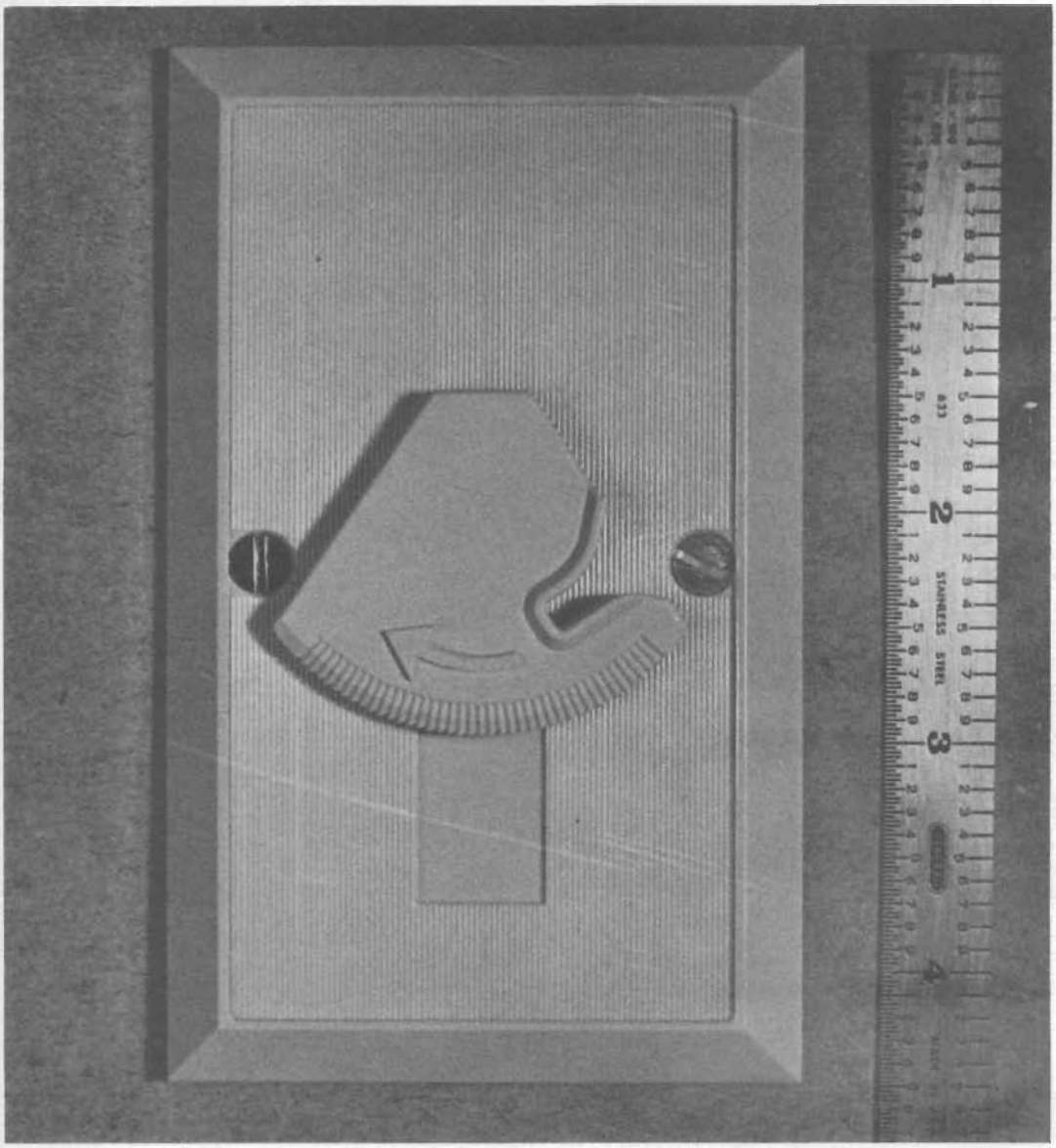
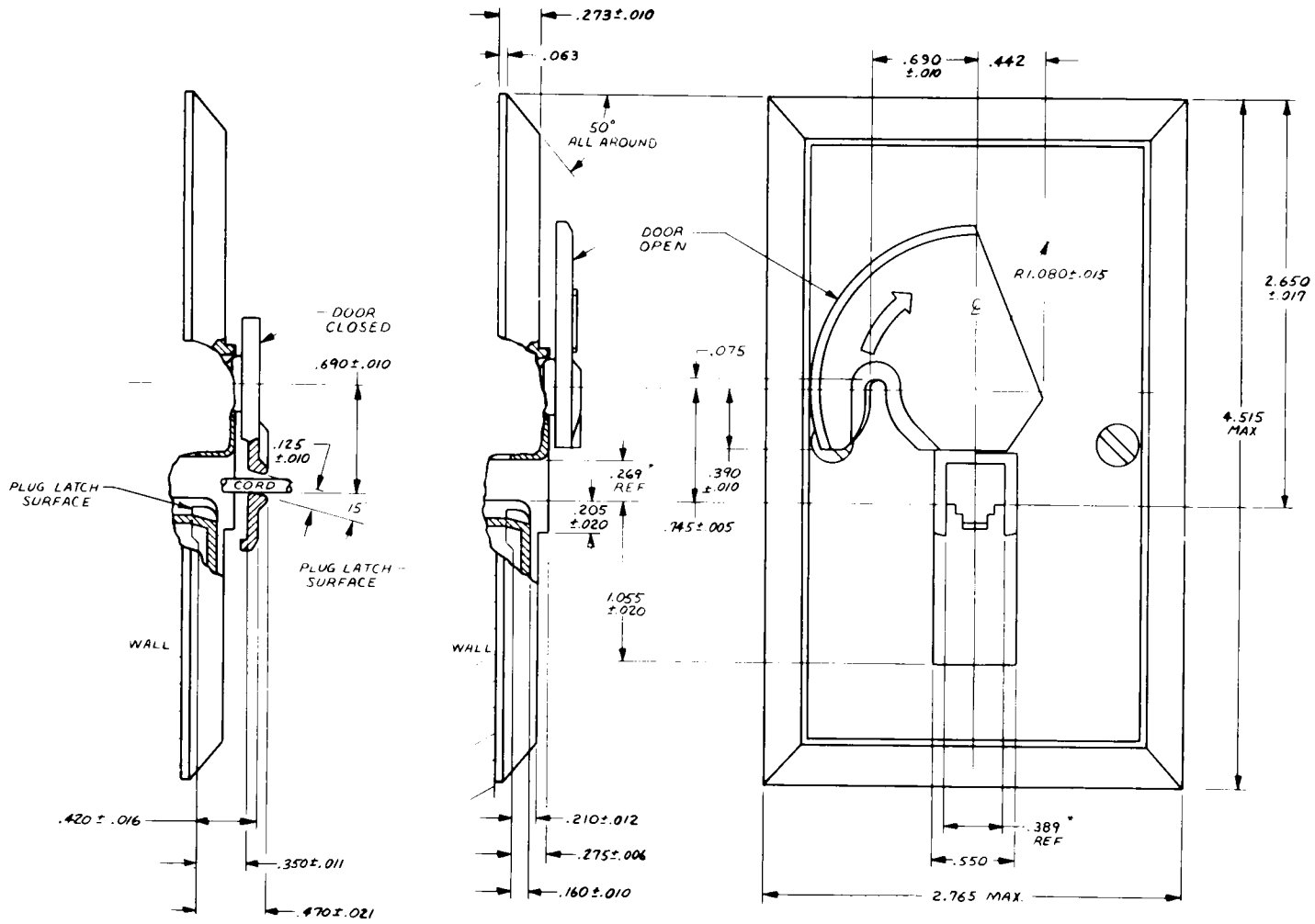


FIGURE 7A

625FS, 725FS, AND 725FSA CONNECTING BLOCKS - SPECIFICATION



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 8A

625H CONNECTING BLOCK

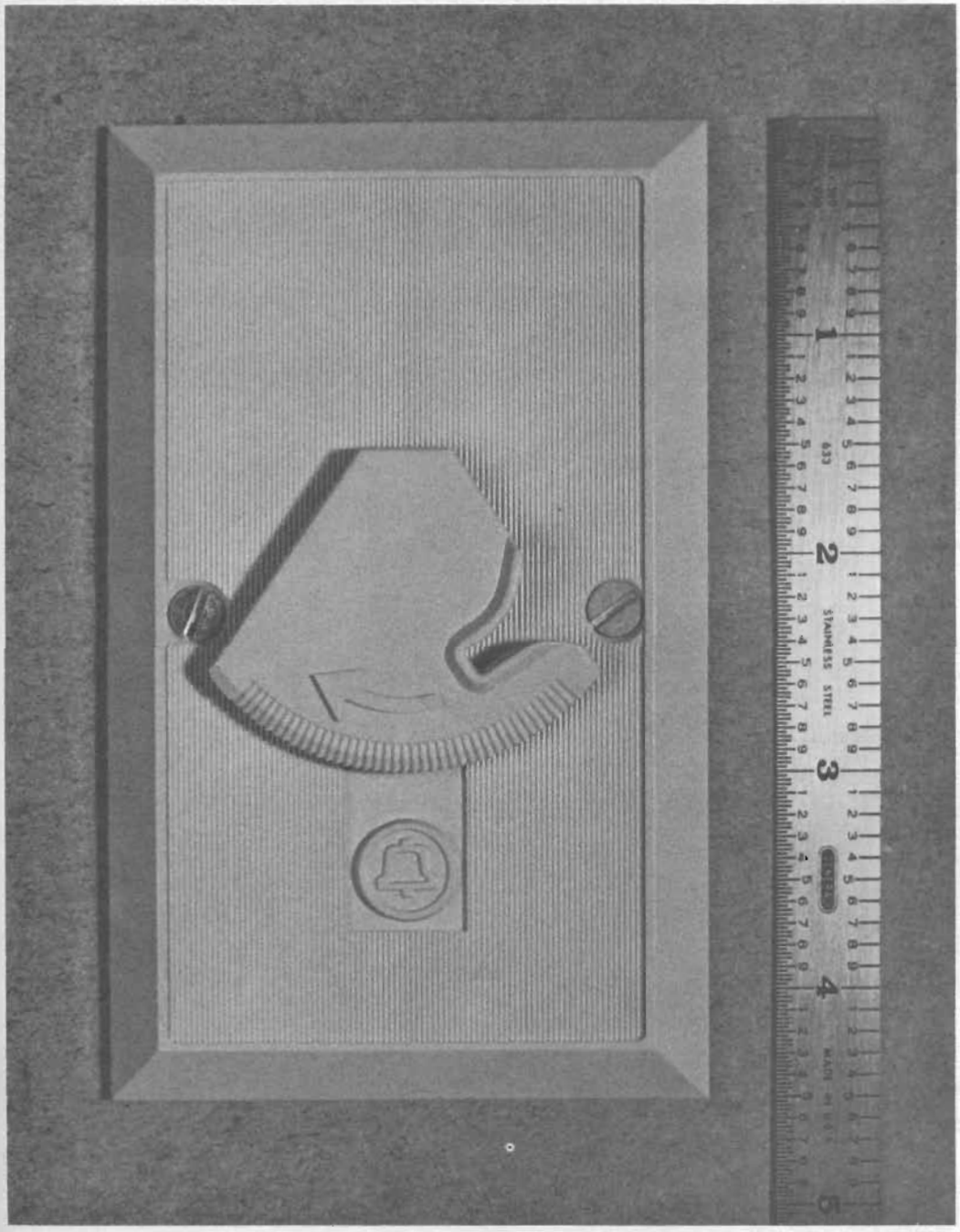
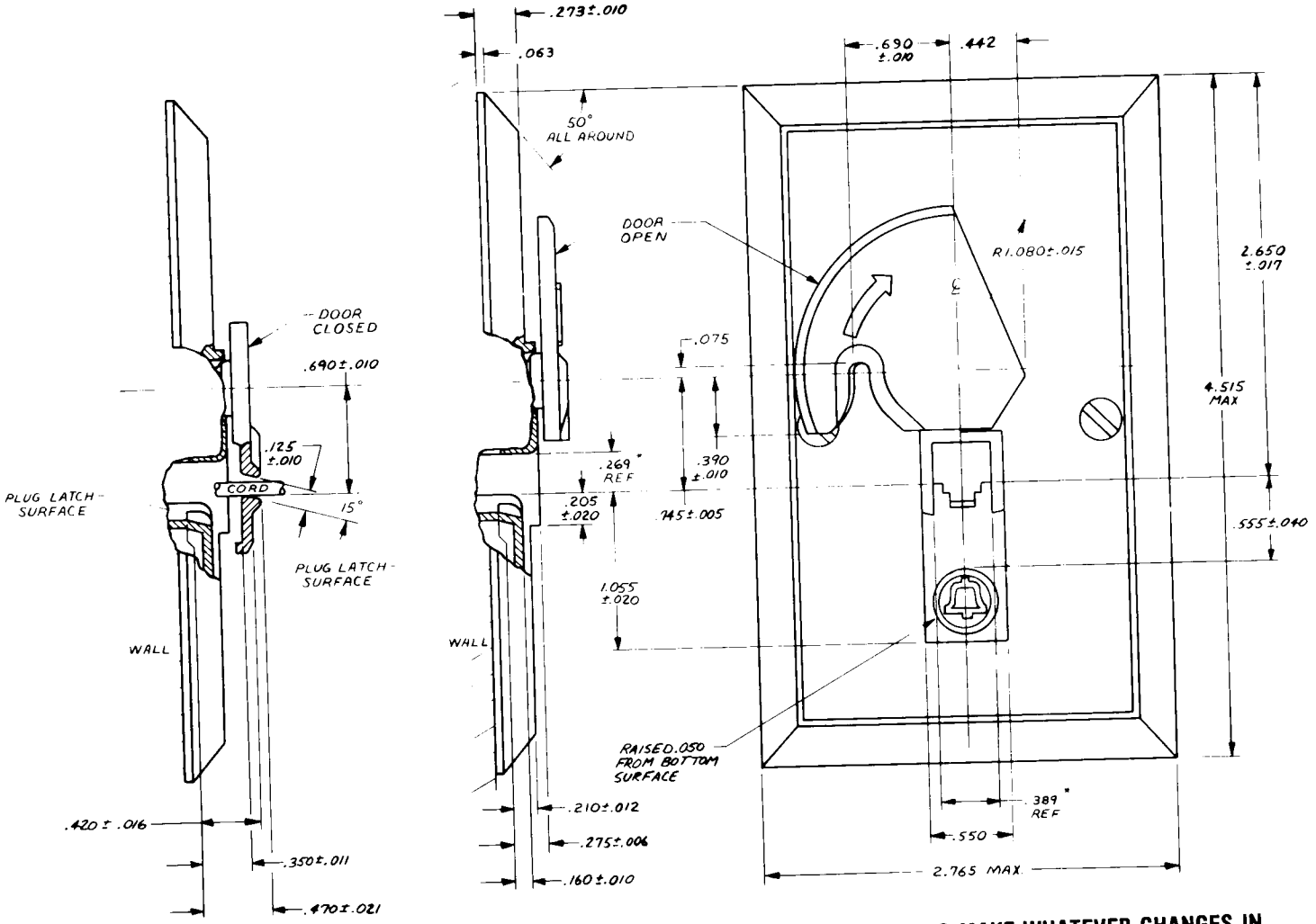


FIGURE 9A

625H CONNECTING BLOCK - SPECIFICATION



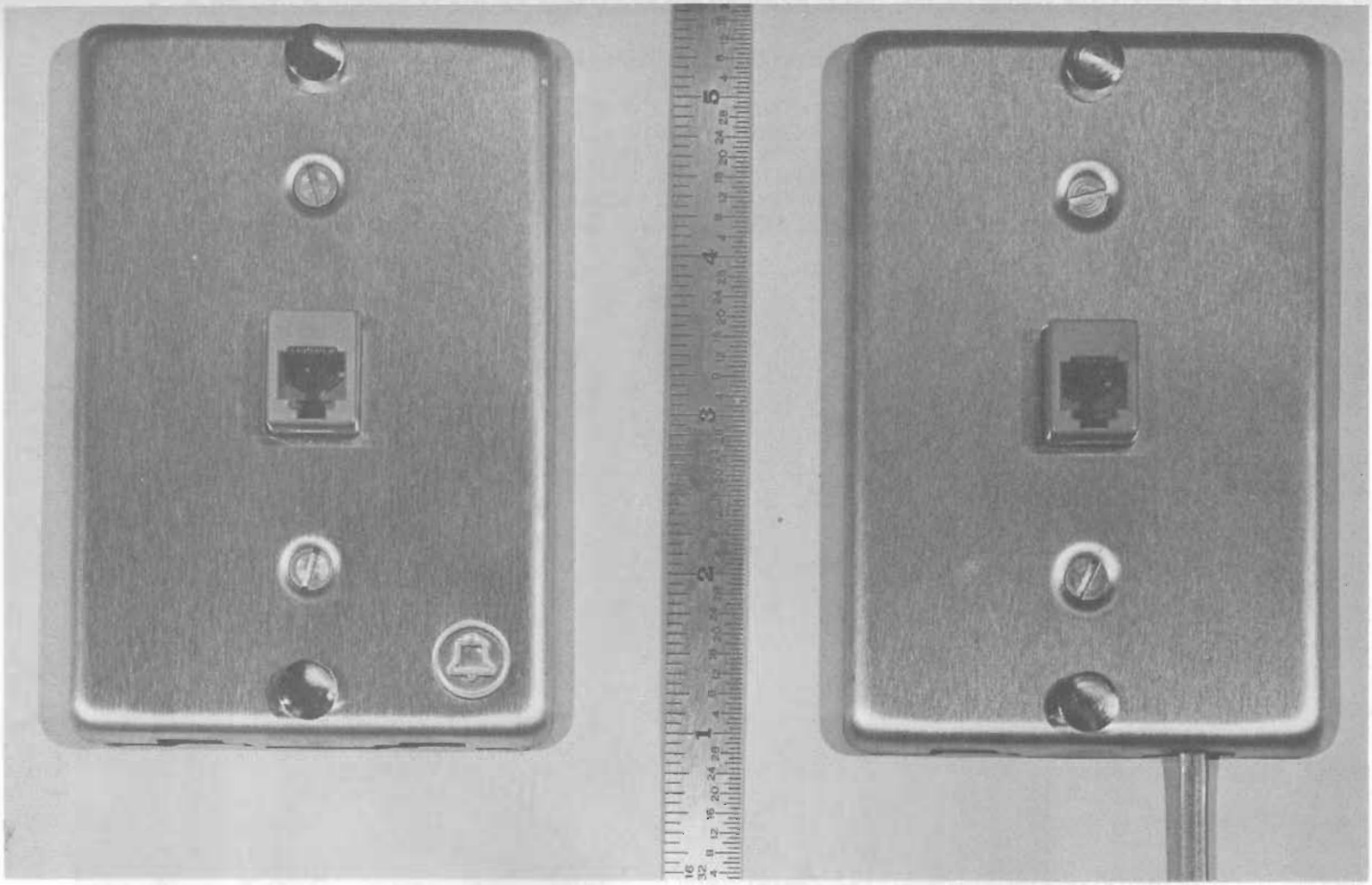
NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.

B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 10A

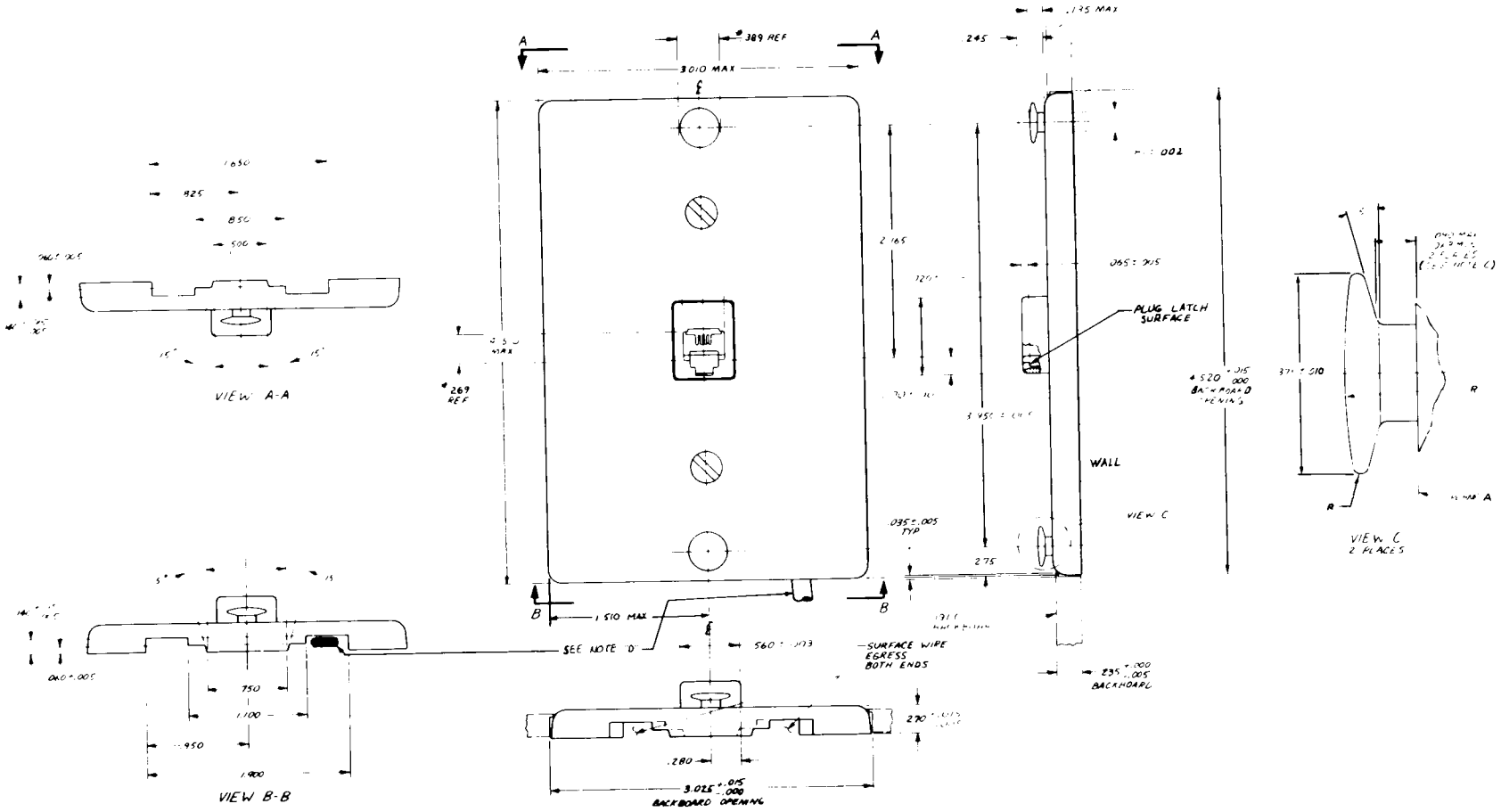
630A, 630B, 730A, 730B, AND 830A4 CONNECTING BLOCKS



Note: The 730A And B Connecting Blocks Have a Plug Ended Cord Egressing From The Bottom Edge Of The Faceplate

FIGURE 11A

630A, 630B, 730A, 730B , AND 830A4 CONNECTING BLOCKS - SPECIFICATION



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. PLANE "A" IS DEFINED AS THE TOP SURFACE OF THE MOUNTING PLATE. THE TOLERANCE SHALL APPLY AT A DISTANCE OF 0.1120 ± 0.0001 INCH FROM THE CENTER OF THE STUD.
D. ON THE 730A AND B A PLUG ENDED CORD EGRESSES THROUGH THE BOTTOM EDGE OF THE FACEPLATE.

FIGURE 12A

635B CONNECTING BLOCK

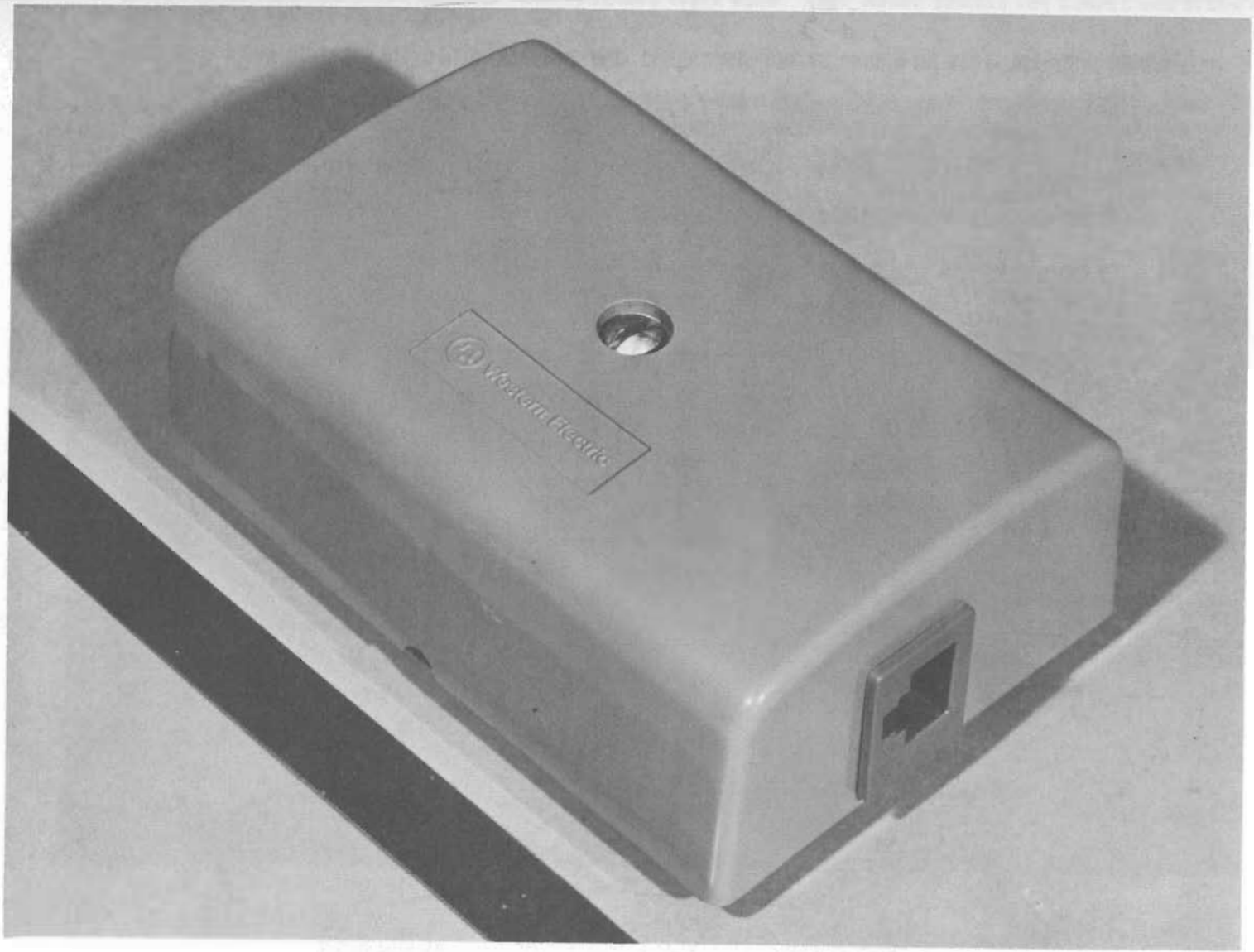
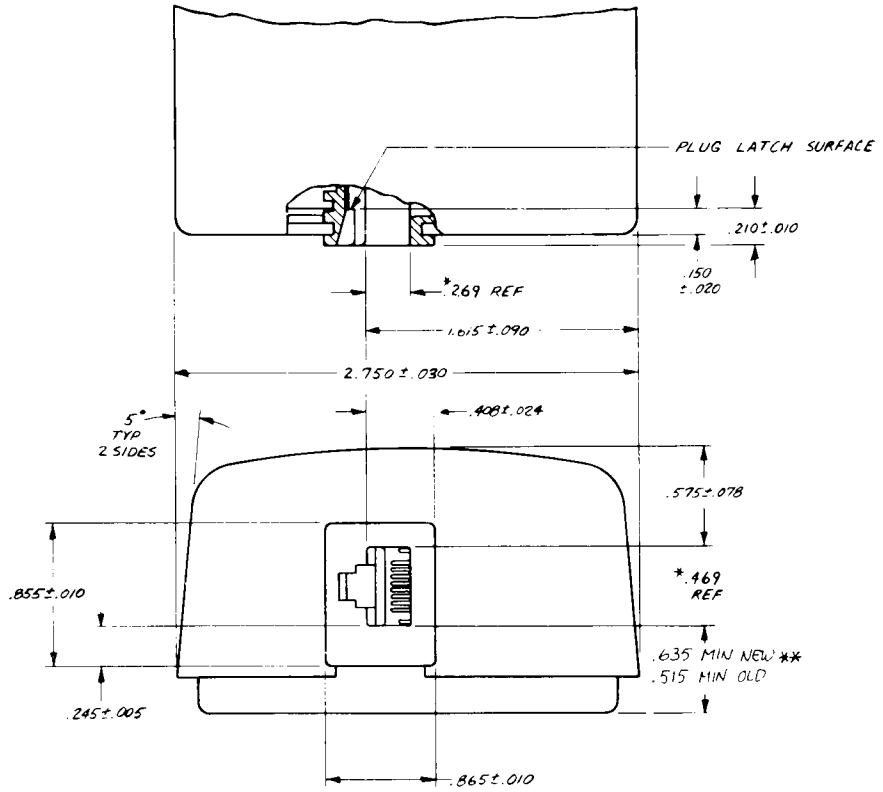


FIGURE 13A

635B CONNECTING BLOCK - SPECIFICATION



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.469, REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIGURES 18 & 19.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. **NEW DIMENSION APPLIES TO PRODUCT MANUFACTURED AFTER APRIL , 1981, WHICH DEPICTS THE CONNECTING BLOCK, MOUNTED ON A NEW ENCLOSED 42C PLASTIC BASE.

FIGURE 14A

625D6 CONNECTING BLOCK

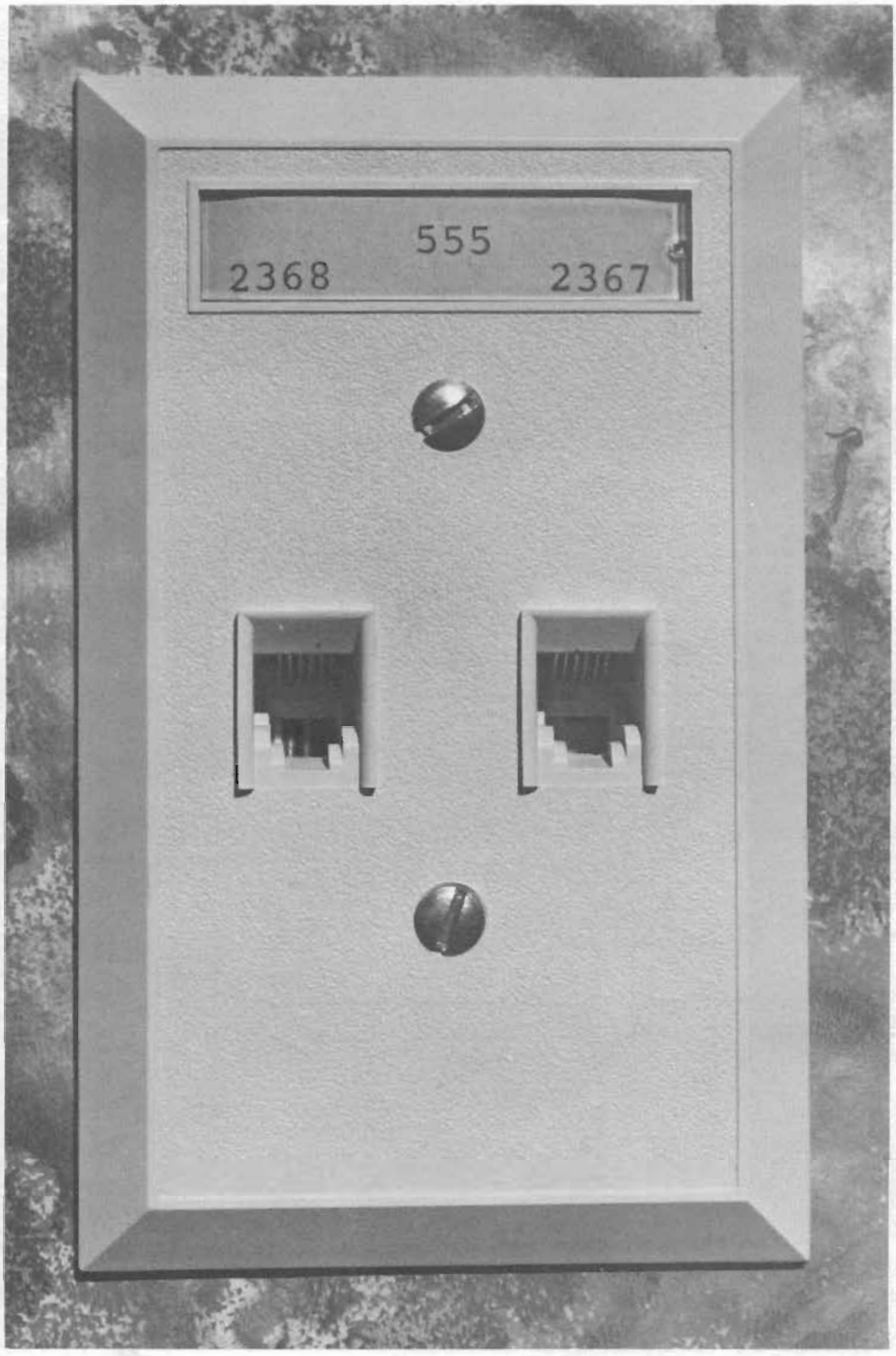
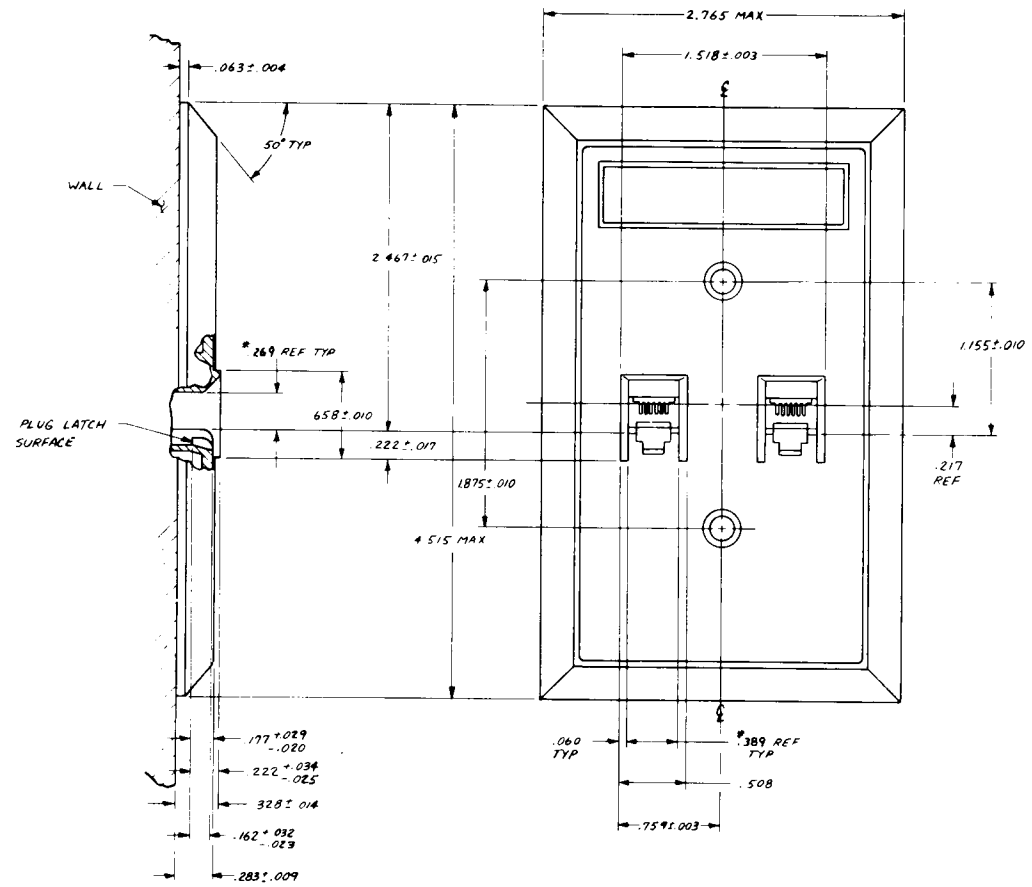


FIGURE 15A

625D6 CONNECTING BLOCK - SPECIFICATION



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.

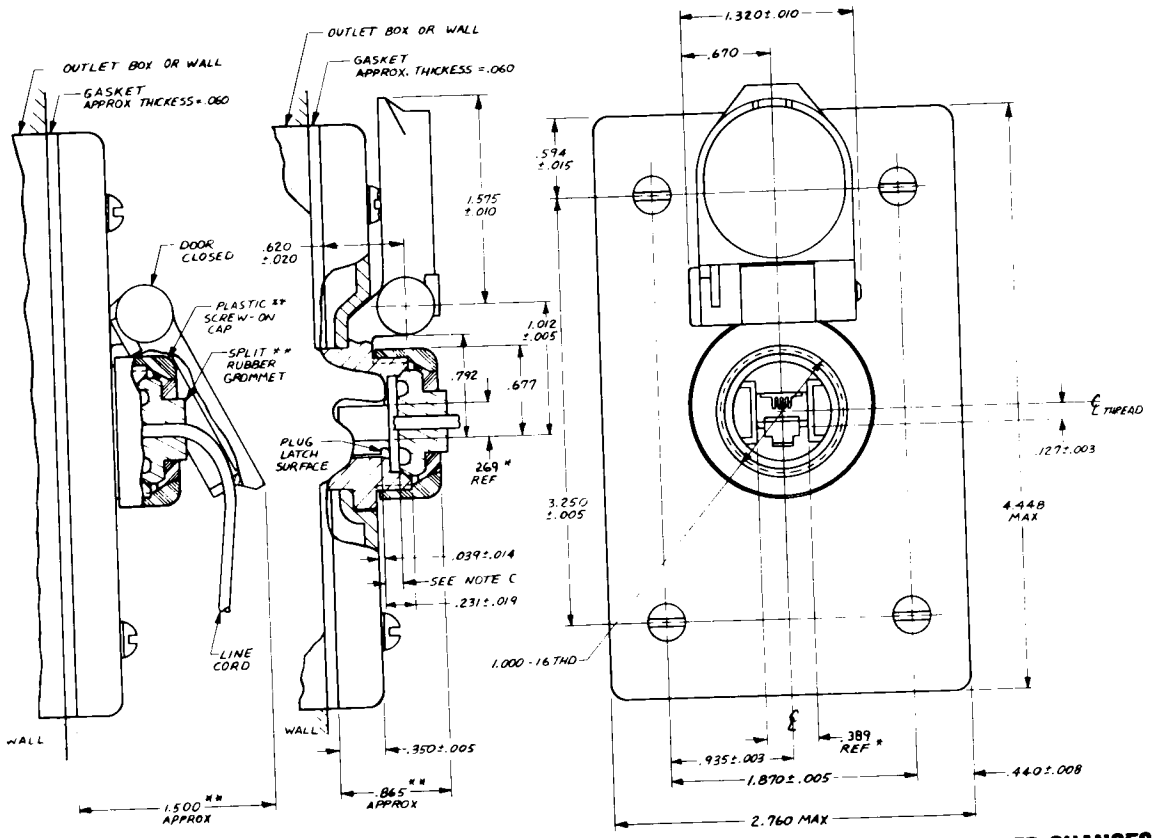
B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 16A

625WP4 CONNECTING BLOCK

FIGURE 17A - SPECIFICATION

625WP4 CONNECTING BLOCK - SPECIFICATION



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. THIS DIMENSION AND THE COMPLIANCE OF THE SPLIT RUBBER GROMMET MUST ALLOW INSERTION AND LATCHING OF A STANDARD 6-POSITION MODULAR PLUG AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 2 AND 3.
D. **FRONT VIEW IS SHOWN WITHOUT THE PLASTIC SCREW-ON CAP AND SPLIT RUBBER GROMMET. THE 1.500 AND .865 DIMENSIONS WILL VARY ACCORDING TO HOW TIGHT THE PLASTIC SCREW-ON CAP IS ASSEMBLED.

FIGURE 18A

74D CONNECTING BLOCK (MD)

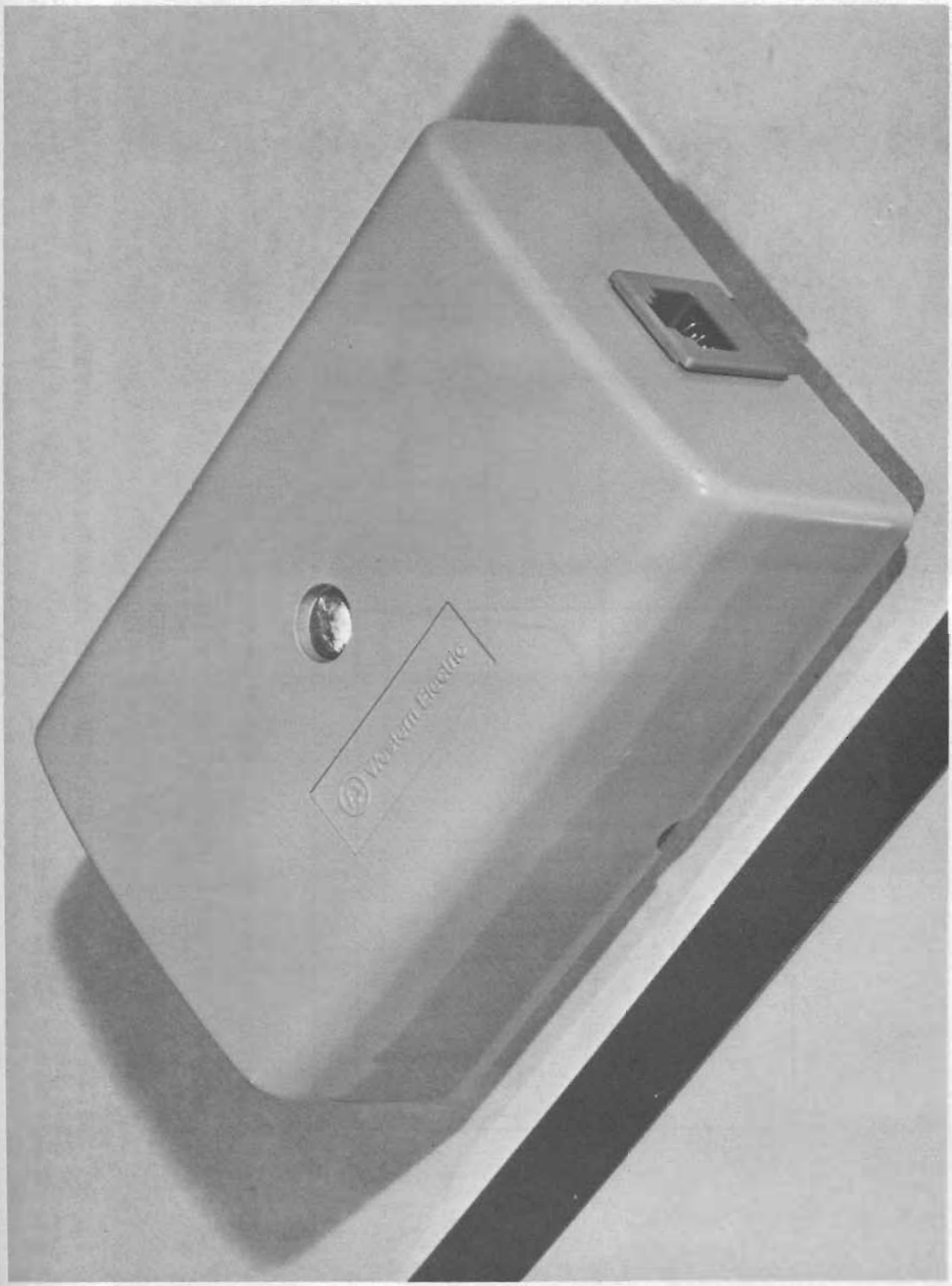
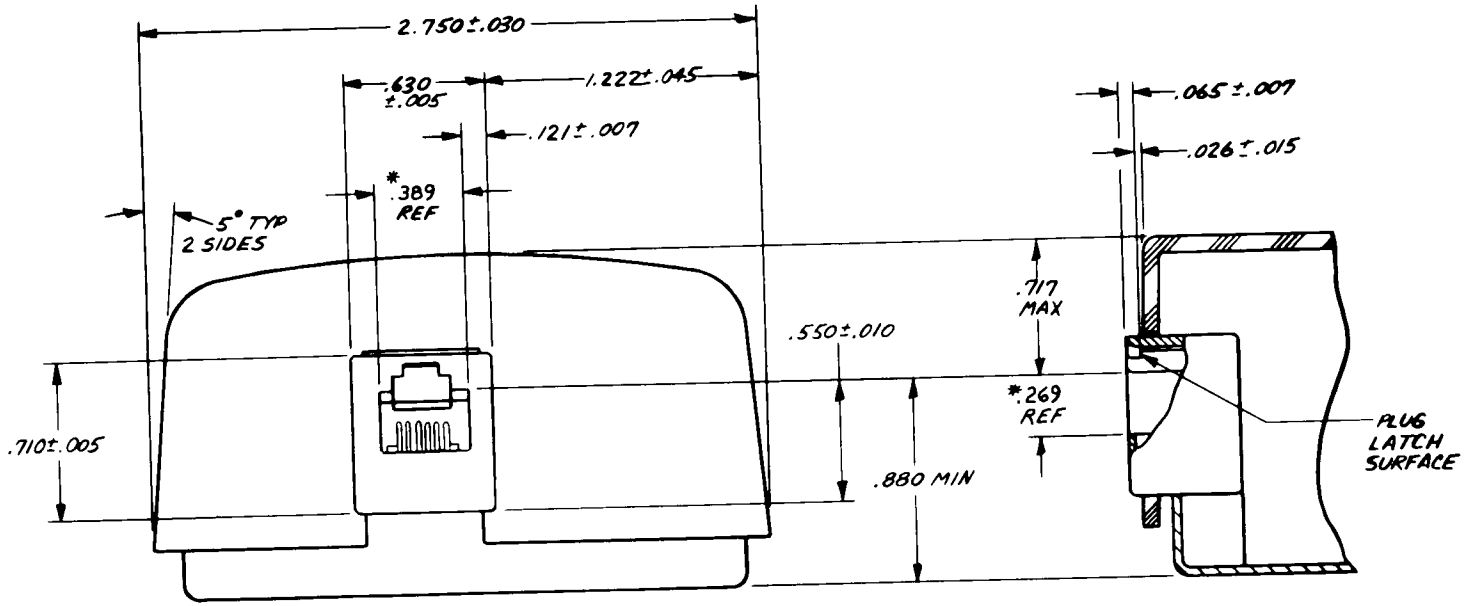


FIGURE 19A

74D CONNECTING BLOCK (MD)



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 20A

225A ADAPTER WITH 4-PIN JACK

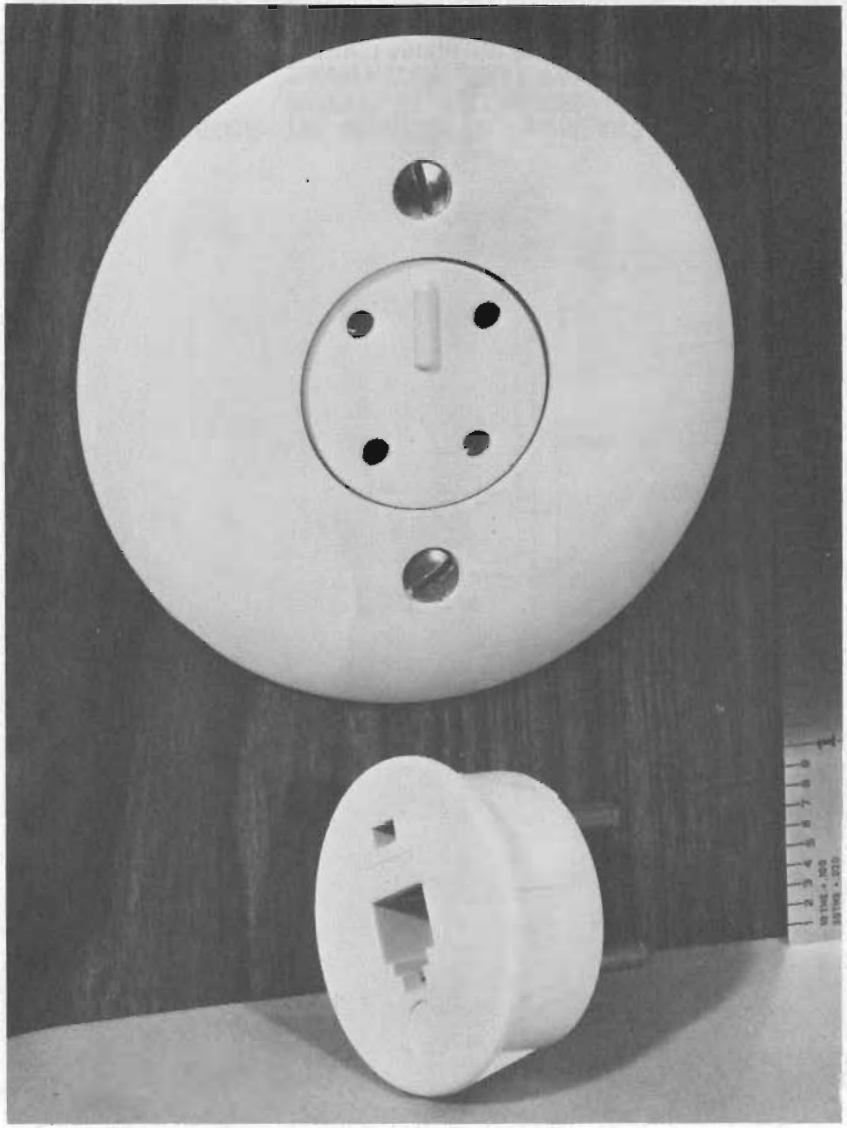


FIGURE 21A

225A ADAPTER INSTALLED IN A 4-PIN JACK

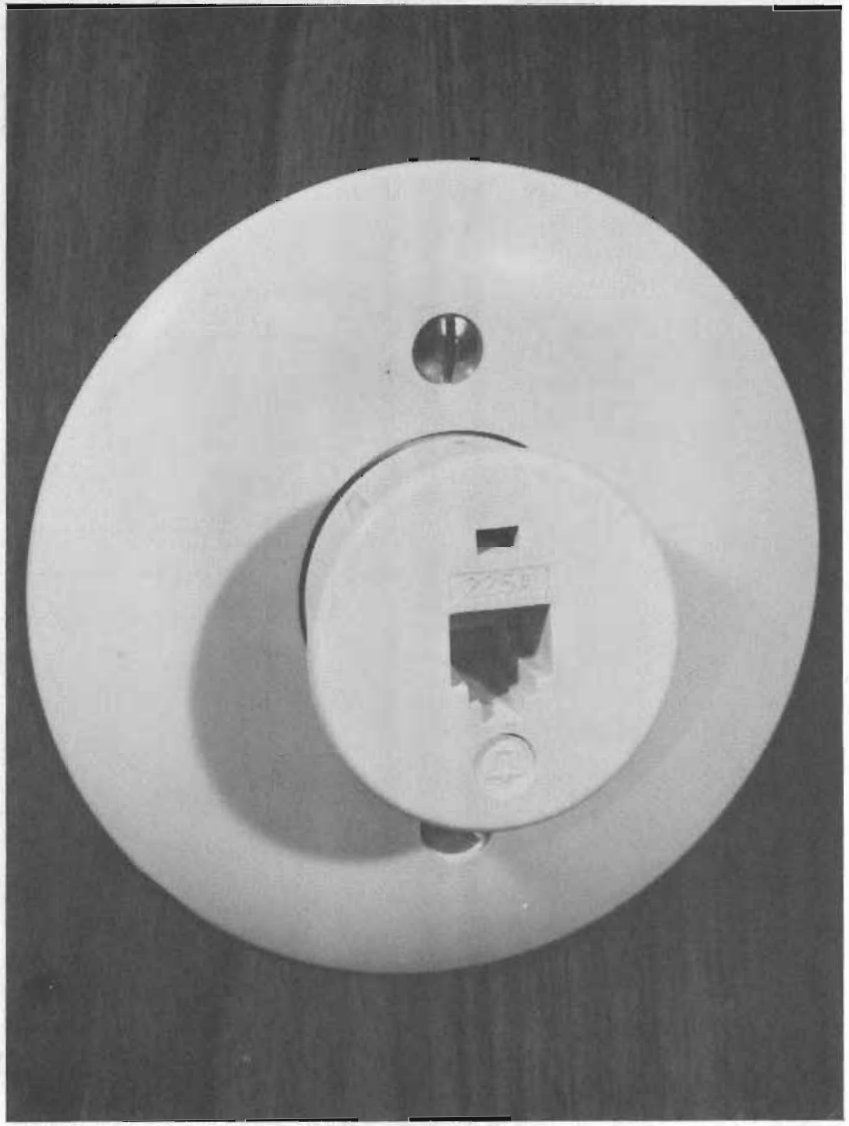
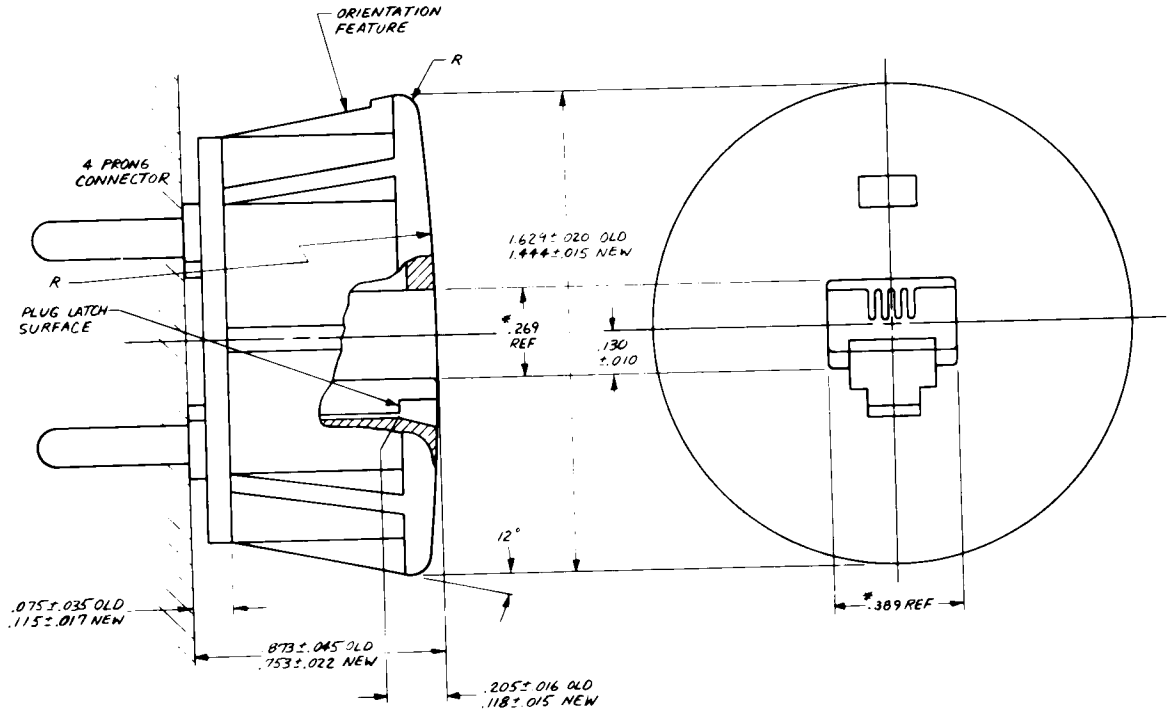


FIGURE 22A

225A ADAPTER - SPECIFICATION



NOTICE: THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY RESERVES THE RIGHT TO MAKE WHATEVER CHANGES IN DIMENSIONS, TOLERANCES, AND REQUIREMENTS ON THIS DRAWING, AND IN THE ASSOCIATED PRODUCT IN MANUFACTURE, THAT MAY BE NECESSARY FOR ANY REASON INCLUDING, BUT NOT LIMITED TO, ONGOING TECHNOLOGICAL OR OPERATIONAL INNOVATIONS THAT MAY BE REQUIRED TO MEET MANUFACTURING AND/OR OPERATING ENVIRONMENT CONDITIONS. IF FURTHER INFORMATION IS REQUIRED, PLEASE CONTACT: MANAGER - INSTALLATION AND MAINTENANCE, FIELD OPERATIONS DISTRIBUTION SERVICES, AT&T COMPANY, 295 N. MAPLE AVE., BASKING RIDGE, N.J. 07920.

A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.
B. THIS DRAWING SHOULD NOT BE SCALED.
C. BODY SHOWN DEPICTS NEW ADAPTER.
D. **NEW DIMENSION APPLIES TO PRODUCT MANUFACTURED AFTER FEBRUARY, 1980.

FIGURE 23A

224A ADAPTER WITH 12-PIN JACK

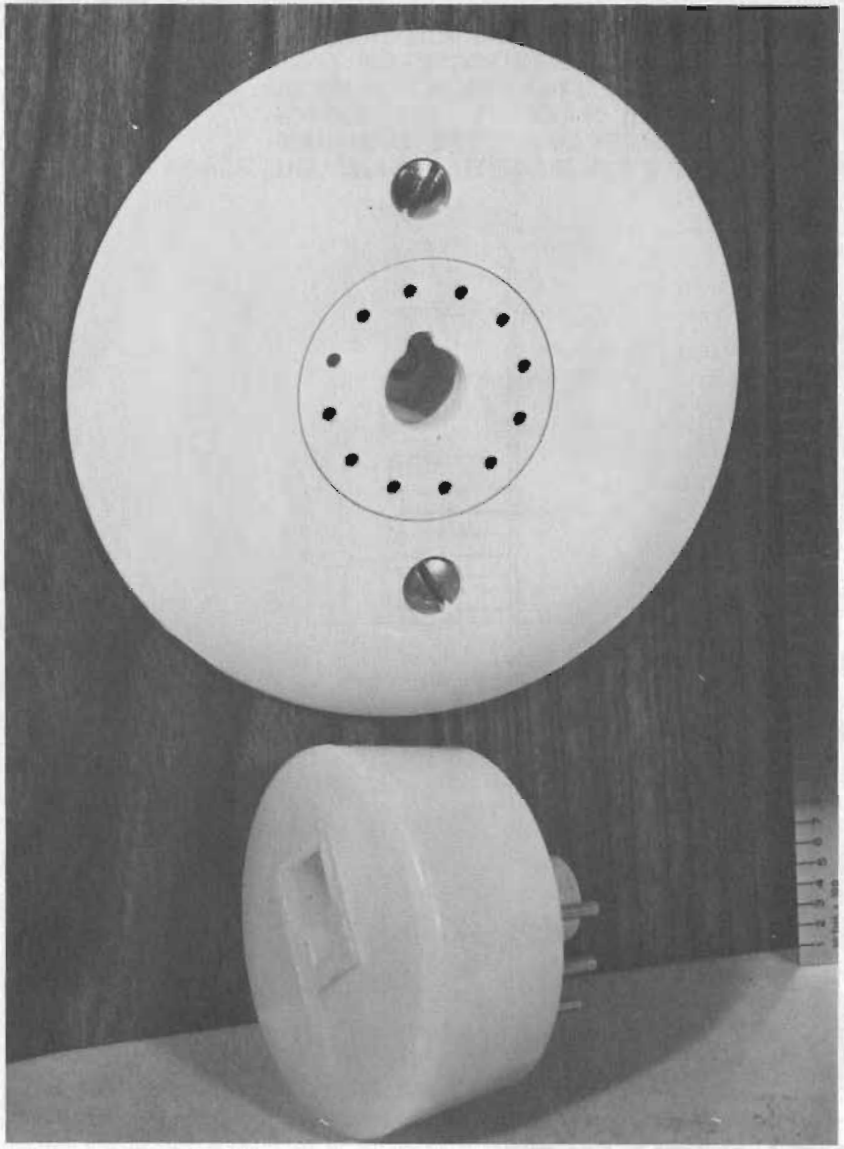


FIGURE 24A

224A ADAPTER INSTALLED IN A 12-PIN JACK

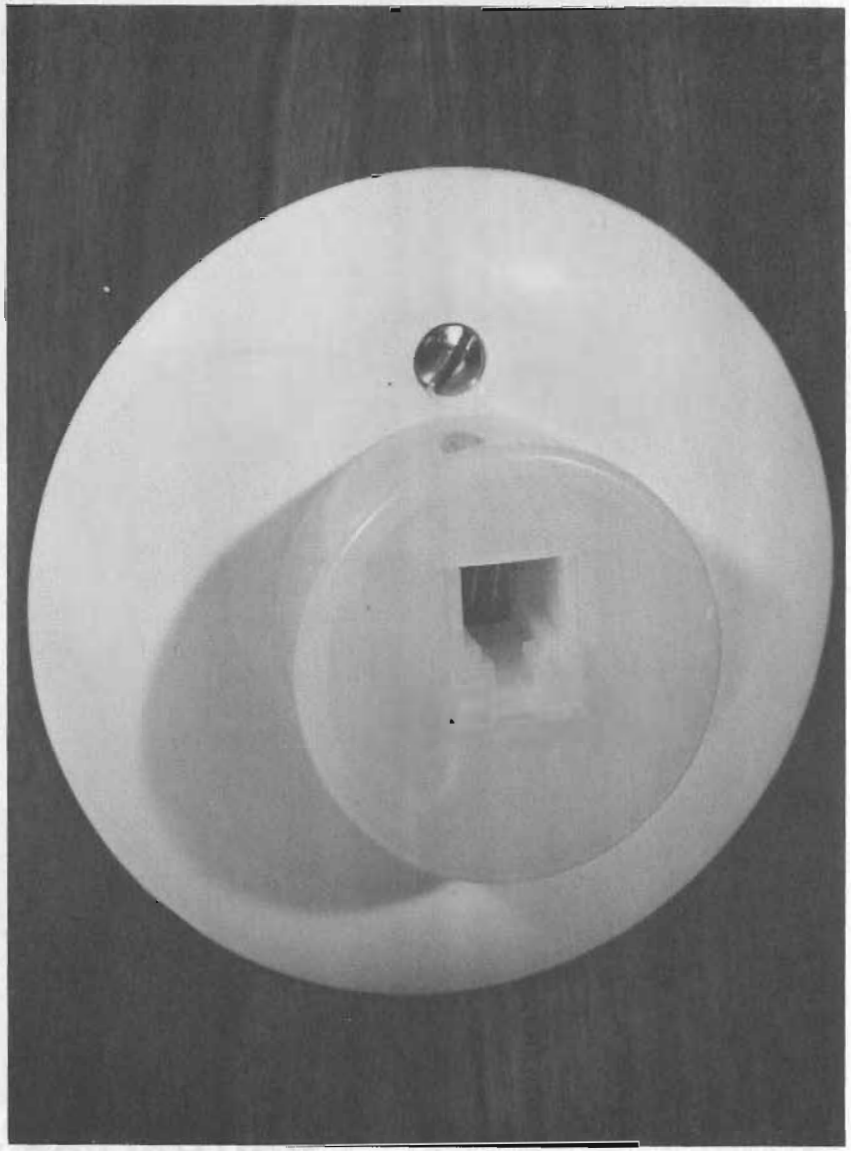
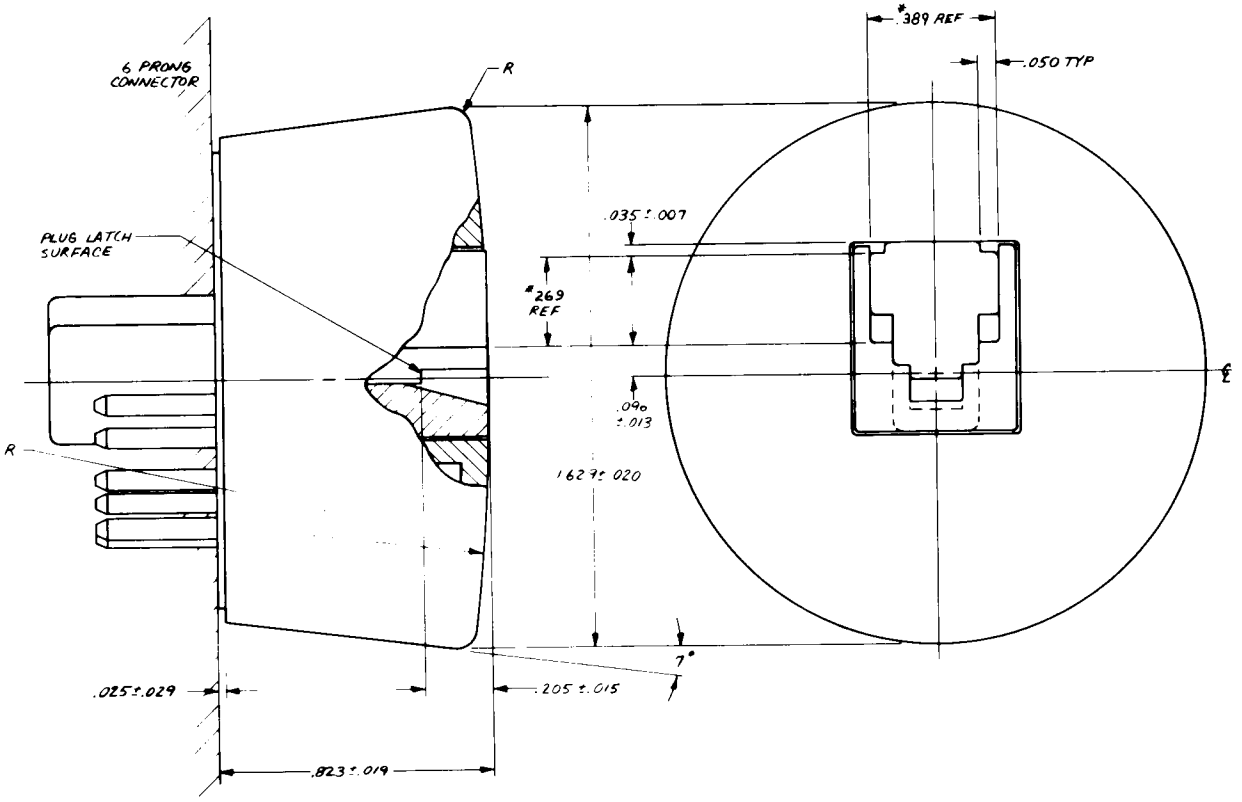


FIGURE 25A

224A ADAPTER - SPECIFICATION



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.

B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 26A

267A "T" ADAPTER

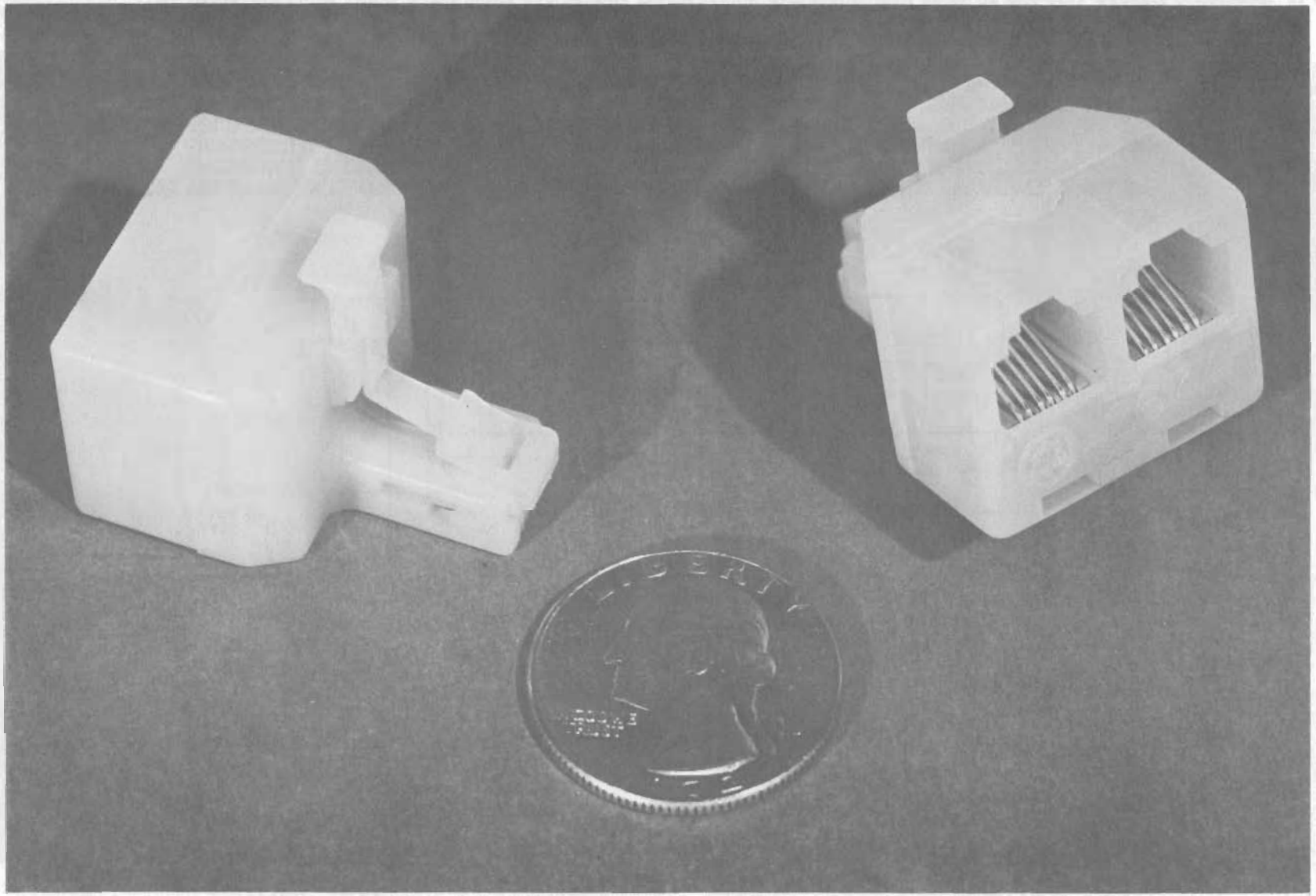
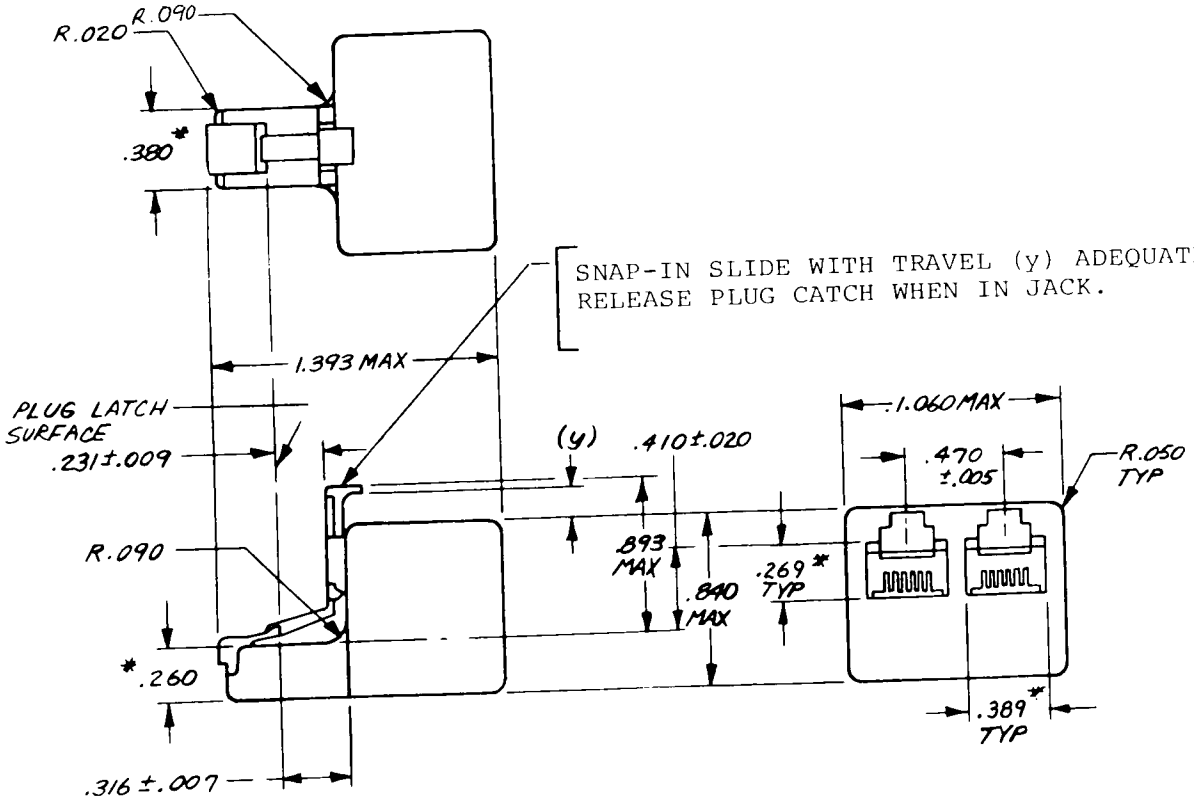


FIGURE 27A

267A "T" ADAPTER - SPECIFICATION



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A. *.260, .380, .269, .389, AND ALL OTHER PLUG AND JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 2, 3, 7, & 8.
B. DEVIATION FROM THESE DIMENSIONS CAN INHIBIT INSTALLATION INTERFACE WITH SOME OF THE BELL SYSTEM PLUGS AND JACKS.
C. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 28A

1A CONVERTER WITH 4-PIN JACK

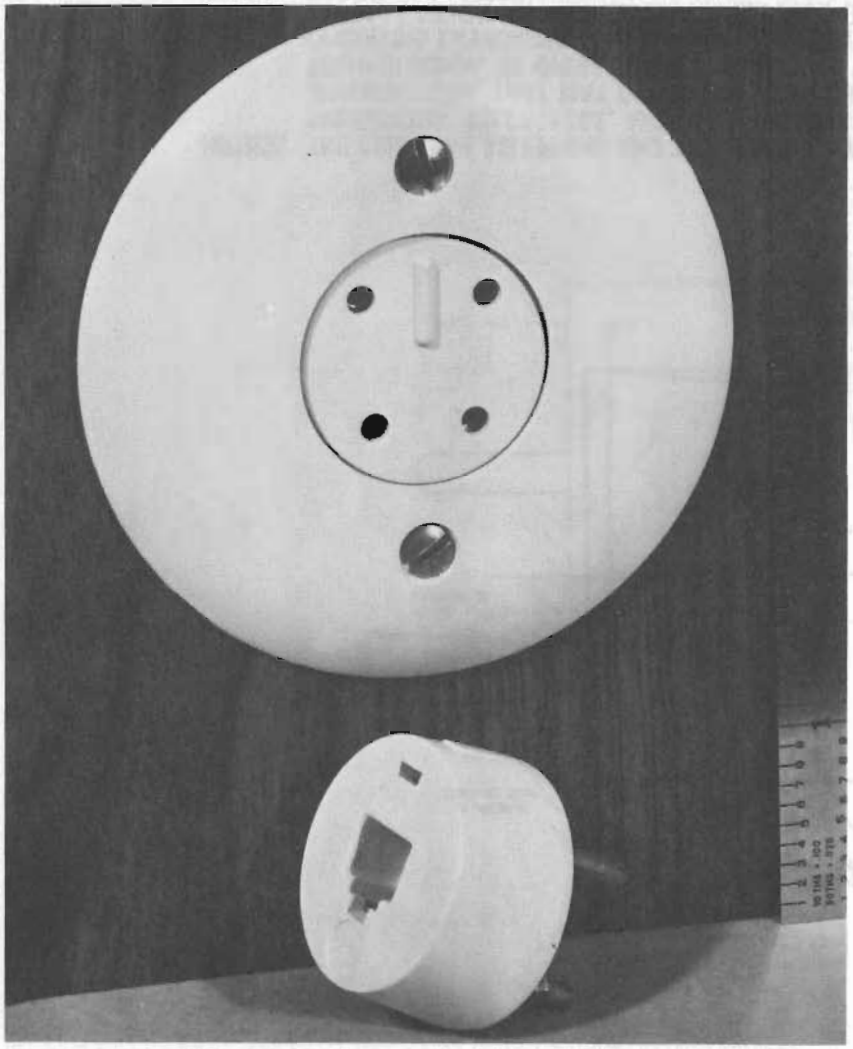


FIGURE 29A

1A CONVERTER INSTALLED IN A 4-PIN JACK

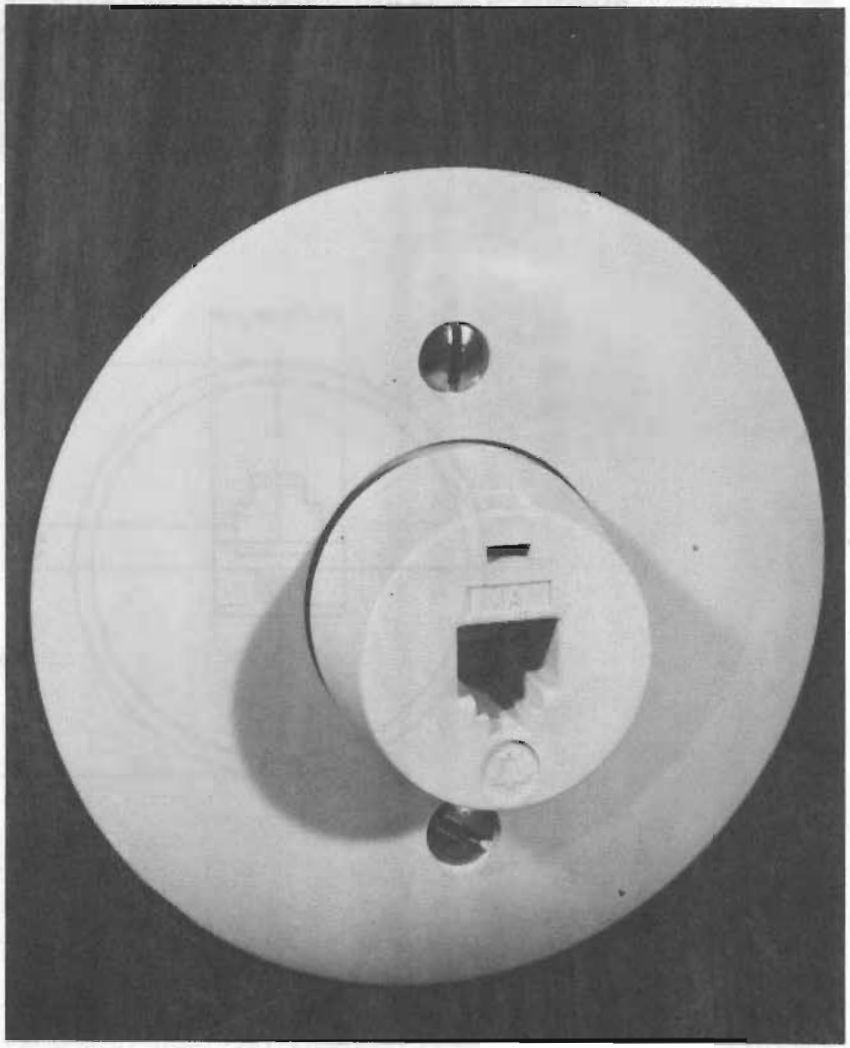
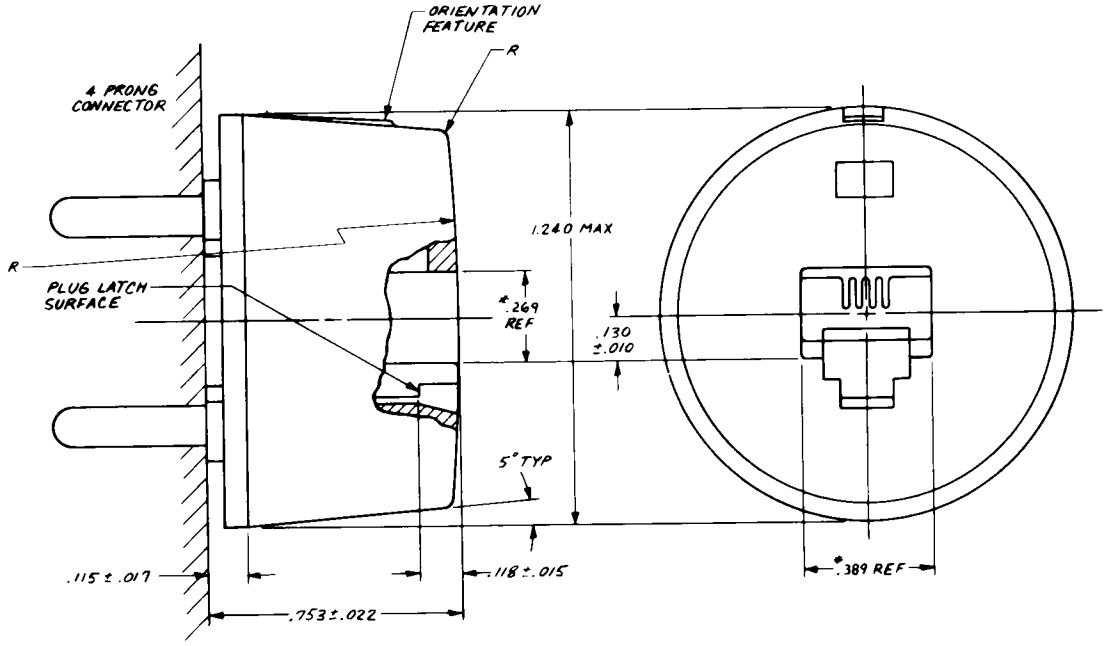


FIGURE 30A

1A CONVERTER - SPECIFICATIONS



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A. *.269 REF, *.389 REF, AND ALL OTHER INTERNAL JACK DIMENSIONS ARE AS SHOWN ON AT&T TECHNICAL DESCRIPTION FIG. 7 AND 8.

B. THIS DRAWING SHOULD NOT BE SCALED.

FIGURE 31A