

Type 10, Type 10 Universal, and Type 10 Connectorized Universal Mounting Shelves

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1. description and application

1.01 The Type 10 Mounting Shelf (figures 1 and 2) provides relay-rack or apparatus-case mounting for Tellabs Type 10 printed circuit modules. These modules plug into 56-pin card connectors at the rear of the shelf. Gold-plated, bifurcated contacts in these connectors ensure positive contact with each module. Connections between modules and to equipment external to the shelf are made via wire-wrapping pins on the back of the shelf (figure 3).

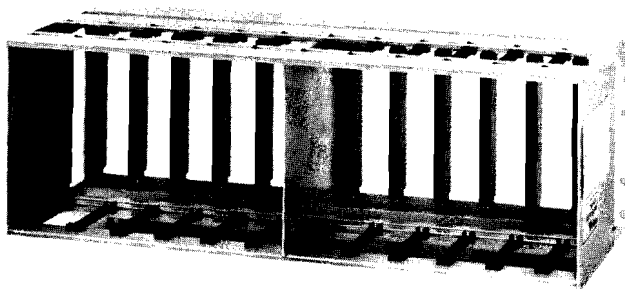


figure 1. Type 10 Shelf for relay-rack installation

1.02 This practice section is revised to make minor typographical corrections and to update section 4.

1.03 Relay-rack configured Type 10 Shelves are also available in universally wired versions and in connectorized universally wired versions. The Type 10 Universal Shelf (figure 4) and Connectorized Universal Shelf (figure 5) each have a rear-mounted hinged backplate at which main-frame tie cables are terminated. The Universal Shelf terminates these tie cables via wire-wrapping, while the Connectorized Universal Shelf is equipped with three 25-pair female cable connectors for tie-cable termination. The Connectorized Universal Shelf also has four 12-pin wire-wrapping connectors on the backplate for battery, ground, and ring generator connections. Designation strips used on the Type 10 Universal Shelves to identify areas in the pin field are shown in figure 6, and the backplate layout of the Type 10 Connectorized Universal Shelves is shown in figure 7.

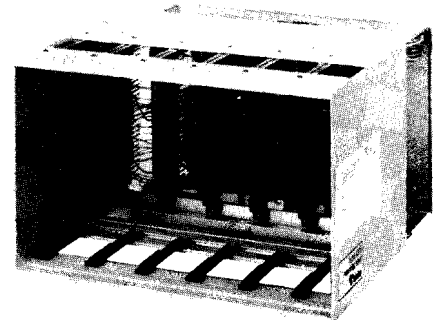


figure 2. 1006 Shelf (KTU configured)

1.04 On both Universal and Connectorized Universal Shelves, jumpers are distributed from the wire-wrapping pin field on the underside of the backplate (the side facing the rear of the shelf) to wire-wrapping pins at the back of the individual module mounting positions. The backplate and its connector and pins function much like an intermediate distributing frame, allowing the CO installer to terminate all main-frame tie cables (via either wire-wrapping or 25-pair connector) when the shelf is installed. Then, as requirements arise, appropriate jumpers can be run from the underside of the backplate to the wire-wrapping pins at the back of the appropriate module positions. When a disconnect (removal) or change order is received, only the jumpers, and not the tie cable, need be cut and removed or changed.

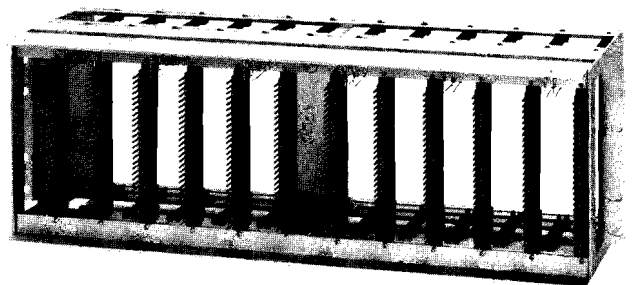


figure 3. Rear of Type 10 Shelf

1.05 Eight versions of the basic (non-universal) Type 10 Shelf are available. Four are designed specifically for relay-rack mounting, while the remaining four mount in KTU apparatus cases (or, via mounting bars, in a relay rack). Some Type 10 Shelves will accept slightly wider Wescom Type 400

modules as well as Tellabs Type 10 modules. Those shelves designed to house only Tellabs Type 10 modules permit a slightly greater mounting density (see table 1).

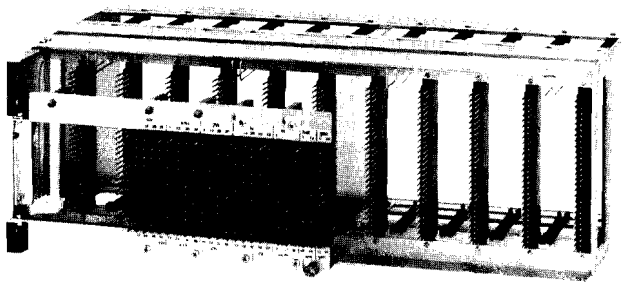


figure 4. Type 10 Universal Shelf

1.06 Four versions of the Type 10 Universal Mounting Shelf (the 1011U, 1012U, 1013U, and 1014U) and four versions of the Type 10 Connectorized Universal Mounting Shelf (the 1011UC, 1012UC, 1013UC, and 1014UC) are available. Their capacities and applications and the modules that they accommodate are the same as those listed in table 1 for the 1011, 1012, 1013, and 1014 Shelves, respectively.

1.07 The Type 10 Shelf is approximately 6 inches high and protrudes approximately 4¾ inches in front of and 0 inches behind the upright frame channel of a standard relay rack. The Type 10 Universal and Connectorized Universal Shelves are approximately 6 inches high and protrude approximately 4¾ inches in front of and 1½ inches behind the upright frame channel of a standard relay rack. Four mounting screws are provided with each shelf for securing the shelf to the rack or apparatus case.

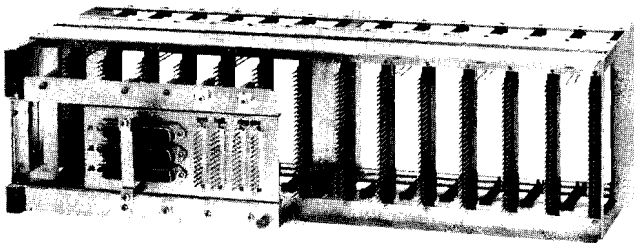


figure 5. Type 10 Connectorized Universal Shelf

1.08 Type 10, Type 10 Universal, and Type 10 Connectorized Universal Shelves are constructed of lightweight brushed aluminum. Large ventilation openings in the top and bottom of each shelf provide a vertical chimney for the escape of heat generated by the electronic equipment mounted

shelf	capacity	application	module type
1002	2 modules	KTU apparatus case	Tellabs or Wescom
1004	4 modules	KTU apparatus case	Tellabs or Wescom
1006	6 modules	KTU apparatus case	Tellabs or Wescom
1009	9 modules	KTU apparatus case	Tellabs or Wescom
1011	11 modules	19-inch relay rack	Tellabs or Wescom
1012	12 modules	19-inch relay rack	Tellabs only
1013	13 modules	23-inch relay rack	Tellabs or Wescom
1014	14 modules	23-inch relay rack	Tellabs only

table 1. Type 10 Shelf versions

therein. When a number of shelves are stacked in a relay rack, convection currents drawn through the chimney aid in keeping the equipment cool. An integral braceplate between module positions at the center of relay-rack versions of the shelf ensures rigidity and prevents warpage. Plastic card guides in the interior of the shelf allow modules to be easily inserted into their correct plug-in connectors.

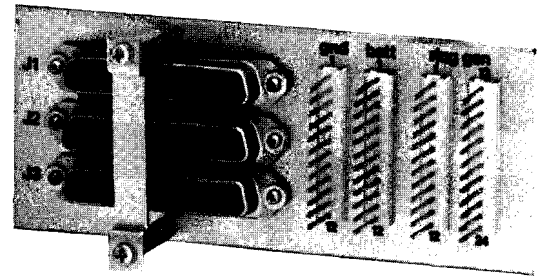


figure 7. Backplate layout (Type 10 Connectorized Universal Shelf)

2. installation

2.01 The Type 10, Type 10 Universal, or Type 10 Connectorized Universal Mounting Shelf should be visually inspected upon arrival to find possible damage incurred during shipment. If damage is noted, a claim should immediately be filed with the carrier. If stored, the shelf should be visually inspected again prior to installation.

mounting

2.02 The 1002, 1004, 1006, and 1009 Shelves mount in KTU apparatus cases by means of mounting ears on the top and bottom of each shelf. If these shelves are to be mounted in a relay rack,

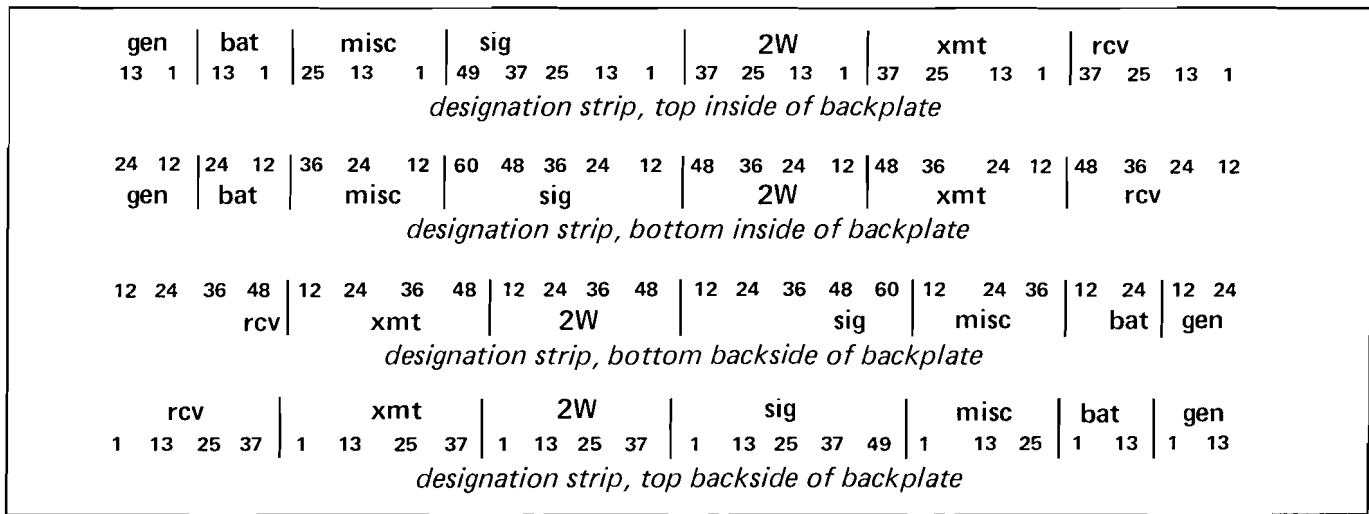


figure 6. Backplate designation strips (Type 10 Universal Shelf)

mounting bars must be used across the rack to provide points of attachment for the mounting ears.

2.03 Relay-rack-configured Type 10 Shelves (the 1011, 1012, 1013, and 1014, as well as their Universal and Connectorized Universal counterparts) require an average of 3.5 mounting spaces (6 $\frac{1}{8}$ inches) per Shelf in racks with 1 $\frac{3}{4}$ -inch mounting spaces and 3.0 mounting spaces (6.0 inches) per Shelf in racks with 2-inch mounting spaces. The maximum numbers of shelves that can be mounted in relay racks of various heights are listed in tables 2 and 3.

type of rack support	overall height (feet-inches)	no. of mounting spaces	maximum no. of Type 10 Shelves
floor	5-2 $\frac{1}{8}$	31	8
floor	7-0	43	12
floor	9-0	56	16
overhead	8-8	48	13
overhead	11-6	68	19

table 2. 19 or 23-inch rack with 1 $\frac{3}{4}$ -inch mounting spaces

type of rack support	overall height (feet-inches)	no. of mounting spaces	maximum no. of Type 10 Shelves
floor	7-0	37	12
overhead	8-8	42	16
overhead	1-6	62	20

table 3. 23-inch rack with 2-inch mounting spaces

2.04 Relay-rack-configured Type 10 Shelves can be mounted in any desired arrangement in 19- or 23-inch racks with 1 $\frac{3}{4}$ -inch mounting spaces (i.e., drilled on 1 $\frac{3}{4}$ -inch centers). In the most efficient arrangement (figure 8 or 9), shelves 1 and 2

together occupy exactly seven mounting spaces. This leaves **complete** mounting spaces immediately above and below shelves 1 and 2 for mounting additional equipment (such as a jackfield, fuse panel, or, as shown, another shelf). This arrangement is the most efficient because it minimizes the occurrence of unusable partial mounting spaces.

Note: When mounting Type 10 Shelves per figure 8 or 9, be certain that the screw holes in the shelf mounting ears and those in the relay rack are lined up **exactly** as shown and that screws (two per mounting ear) are inserted **exactly** where indicated in the figure. Note that a 1 $\frac{3}{4}$ -inch gap will occur between shelves 1 and 2; this gap will also occur between shelves 3 and 4, 5 and 6, etc. No gap will exist between shelves 2 and 3, 4 and 5, etc. If shelf 1 is mounted properly, the others will automatically fall into the correct pattern.

2.05 When relay-rack-configured Type 10 Shelves are mounted on 23-inch racks with 2-inch mounting spaces (i.e., drilled on 2-inch centers), each shelf occupies 3.0 mounting spaces, and there are no gaps between shelves. For maximum density, install the first shelf as close to the top of the rack as alignment of the mounting holes allows.

tie cable installation

2.06 Tellabs recommends the use of three tie cables from the main frame to the Universal and Connectorized Universal Shelves. The use of separate transmit, receive, and signaling/2wire cables minimizes crosstalk and separates high and low transmission levels. On Universal Shelves, tie cables are terminated to appropriate wire-wrapping pins on the rear of the backplate (figure 6). On Connectorized Universal Shelves, tie cables are terminated at connectors J1 through J3 (figure 7). Two 12-pin wire-wrapping connectors, *batt* and *gnd*, are used for battery and ground connections, respectively. Two 12-pin connectors labeled *ring gen* are used for ringing generator connections. Routing of tie cables is described in paragraphs 2.07 and 2.08

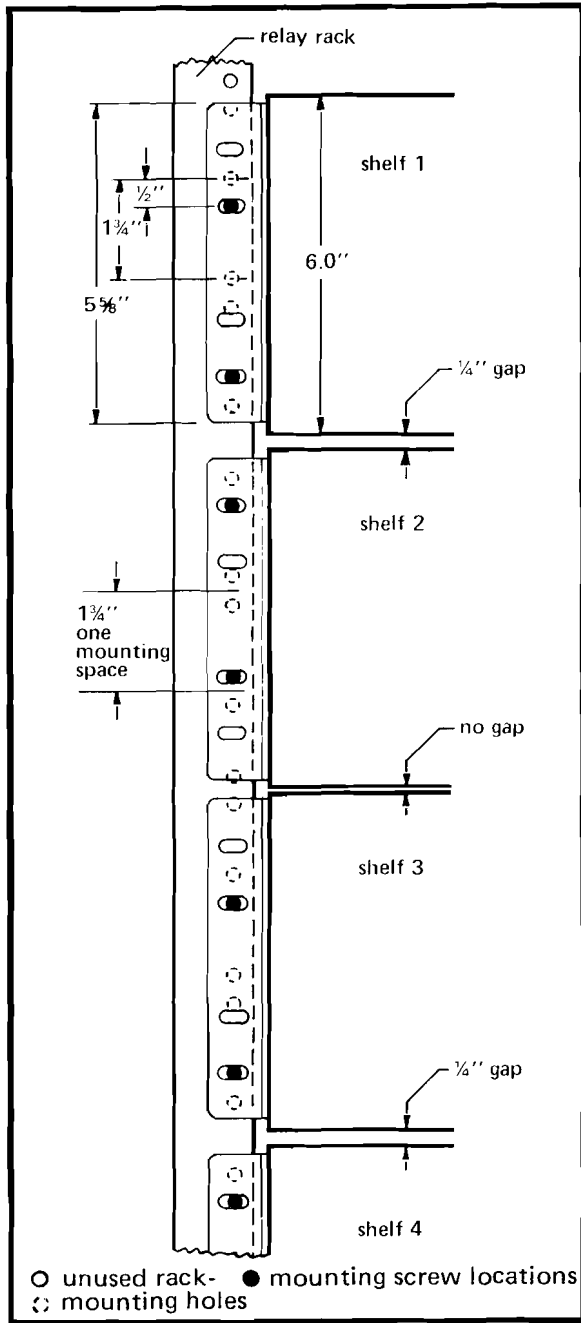


figure 8. Shelf lineup for maximum density in relay racks drilled on 1/4-inch centers

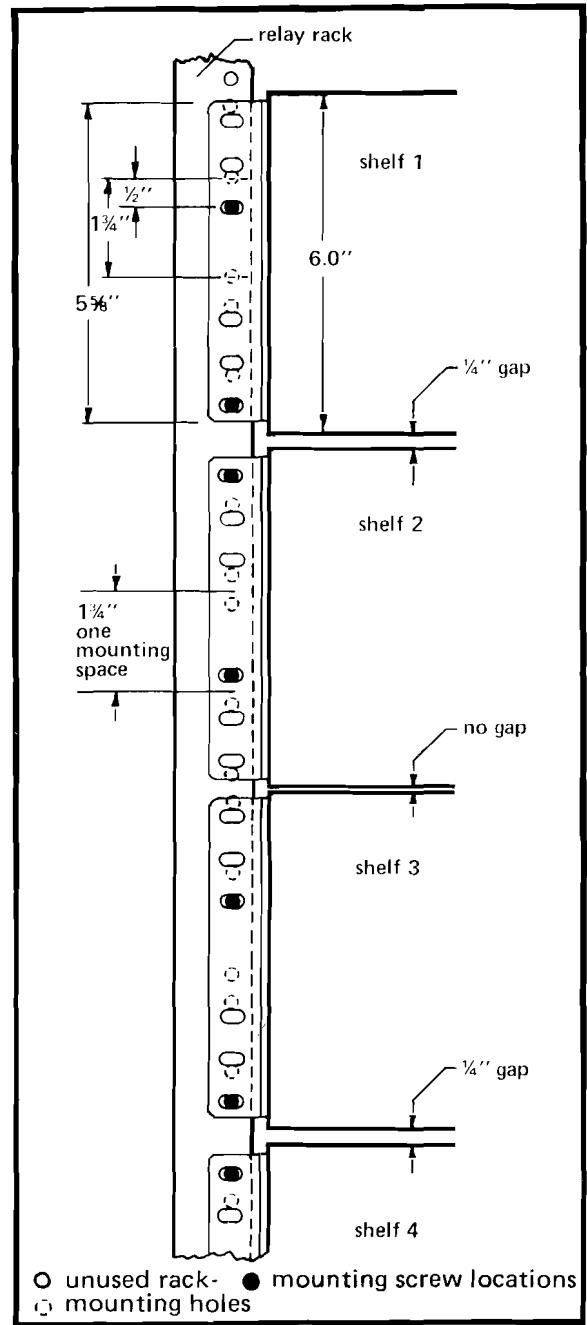


figure 9. Maximum-density lineup for older-model Type 10 Shelves (with 6-hole mounting ears)

2.07 Universal Shelves. Tie cables from the main frame are routed to the Universal Shelf from the left side (looking at the shelf from the rear). As the cable approaches the shelf, two tie mounts are provided to stabilize and properly route the cable. At this point (see figure 10), the tie cable is routed downward into a service loop that allows the hinged backplate to swing open freely. The loop must be full but should not extend below the bottom of the

shelf, as it could then interfere with the shelf immediately below. After the service loop, the cable is routed upward and across the top of the backplate to two tie mounts for stability at this end of the loop. Individual leads are then routed downward across the bottom of the backplate and fanned up to the appropriate wire-wrapping pins. Tie mounts are provided across the bottom of the backplate to dress groups of leads. Tie cables to the Type 10

Universal Shelf **must be routed as described above** to prevent undue bending, fatigue, and resultant physical failure of the cable as the backplate is moved from the open position (figure 11) to the closed position (figure 10).

2.08 Connectorized Universal Shelves. Connectorized tie cables from the main frame are routed to the Connectorized Universal Shelf from the left side (looking at the shelf from the rear). As the cable approaches the shelf, two tie mounts are provided to stabilize and properly route the cable. At this point (see figure 10), the cable is routed downward into a service loop in essentially the same manner as for the Universal Shelf. Again, the loop must be full but should not extend below the bottom of the shelf. After the service loop, the cable is routed directly to one of the 25-pair cable connectors. The backplate of the Type 10 Connectorized Universal Shelf has a reversible connector hold-down bracket for use with both low-profile and high-profile cable connector hoods. This bracket is secured via two screws to standoff posts on the rear of the backplate and must be removed to install the 25-pair cables. After the tie cables are installed, replace the bracket as shown in figure 12. Tie

cables to the Type 10 Connectorized Universal Shelf **must be routed as described above.** Non-connectorized tie cables from the main frame (battery, ground, or ring generator connections) are routed to the Connectorized Universal Shelf as described in paragraph 2.07.

jumper installation

2.09 Jumper leads from the backplate to various module positions may be installed as required. Figure 11 provides a visual reference for the following description of jumper-lead routing. (Please note that while figure 11 shows a Type 10 Universal Shelf, jumper installation and routing on Type 10 Connectorized Universal Shelves is essentially the same.) Leads from the various module positions are routed up and through wire guides at the top of the shelf, then to the left rear side of the shelf, where **a service loop must be constructed** to provide freedom of movement for the hinged backplate and to position the leads to prevent fatigue and subsequent failure as the backplate is opened and closed. One wire saddle is provided near the bottom of the service loop to maintain the loop's position. The loop extends to the bottom of the shelf and returns to the top of the backplate. Individual leads

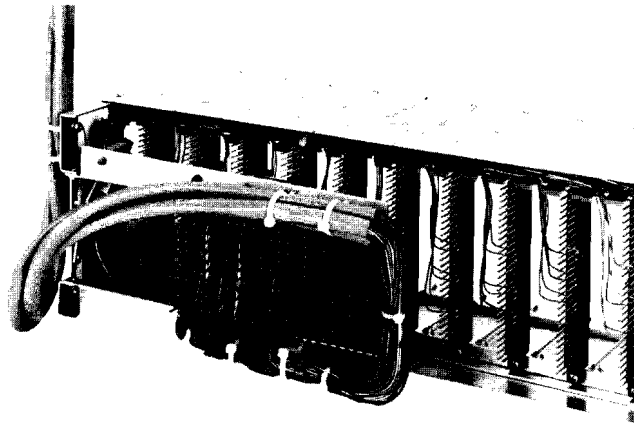


figure 10. Type 10 Universal Shelf in operating configuration (backplate locked in place)

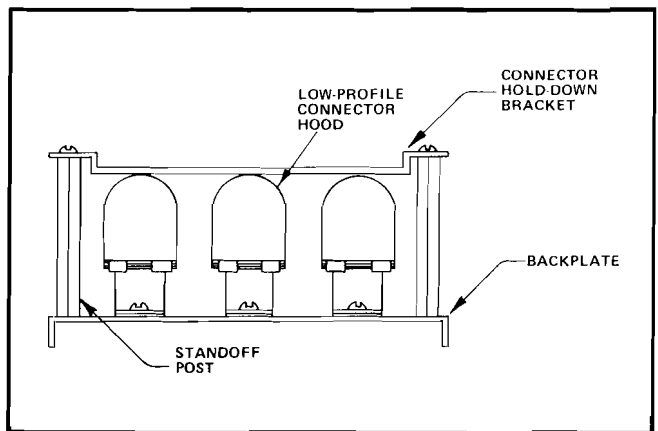
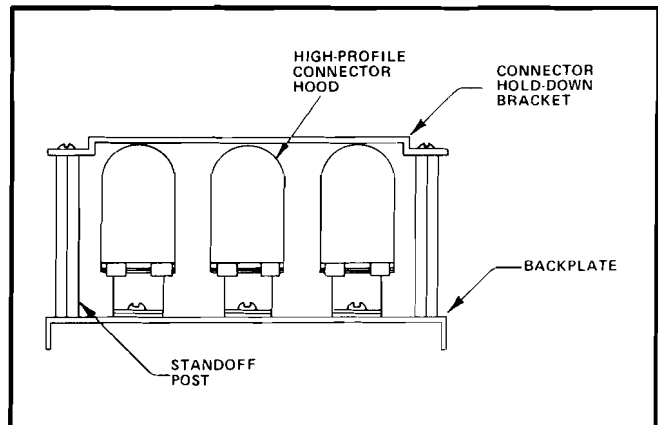


figure 12. Attachment of reversible hold-down bracket when used with high-profile cable connector hoods (upper illustration) and with low-profile connector hoods (lower illustration)

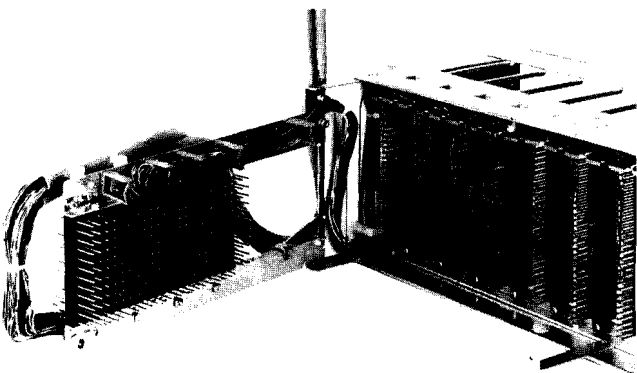


figure 11. Type 10 Universal Shelf with backplate swung open for jumper access

are fanned from the top of the backplate down to appropriate pins. Saddles are provided across the top of the backplate to dress the cable.

2.10 After all wiring is completed, return the hinged backplate to the closed position. To secure the backplate, a spring-loaded fastener at the lower righthand corner of the backplate is screwed into a receptacle on the main body of the shelf.

3. specifications

Type 10 Shelves

capacity and type of mounting

- *1002: 2 modules, KTU app. case
 - *1004: 4 modules, KTU app. case
 - *1006: 6 modules, KTU app. case
 - *1009: 9 modules, KTU app. case
 - *1011: 11 modules, 19-inch relay rack
 - 1012: 12 modules, 19-inch relay rack
 - *1013: 13 modules, 23-inch relay rack
 - 1014: 14 modules, 23-inch relay rack
- *These Shelves are compatible with Wescom Type 400 modules and others of like dimensions.

connectors

56-pin, with bifurcated, gold-plated contacts

dimensions (excluding mounting ears)

height (all): 5.92 inches (15.04cm)
depth (all): 7.31 inches (18.57cm)

width

- 1002: 3.19 inches (8.10cm)
- 1004: 6.28 inches (15.95cm)
- 1006: 9.35 inches (23.75cm)
- 1009: 13.9 inches (35.31cm)
- 1011: 17.00 inches (43.18cm)
- 1012: 17.50 inches (44.45cm)
- 1013: 20.00 inches (50.80cm)
- 1014: 20.40 inches (51.82cm)

weight

- 1002: 12 ounces (0.34kg)
- 1004: 1 pound 8 ounces (0.68kg)
- 1006: 2 pounds 9 ounces (1.16kg)
- 1009: 3 pounds 14 ounces (1.76kg)
- 1011: 4 pounds 8 ounces (2.05kg)
- 1012: 4 pounds 11 ounces (2.12kg)
- 1013: 5 pounds 2 ounces (2.32kg)
- 1014: 5 pounds 5 ounces (2.41kg)

Type 10 Universal and Connectorized Universal Shelves

capacity and type of mounting

- *1011U and 1011UC: 11 modules, 19-inch relay rack
 - 1012U and 1012UC: 12 modules, 19-inch relay rack
 - *1013U and 1013UC: 13 modules, 23-inch relay rack
 - 1014U and 1014UC: 14 modules, 23-inch relay rack
- *These Shelves are compatible with Wescom Type 400 modules and others of like dimensions.

connectors

56-pin, with bifurcated, gold-plated contacts

dimensions (excluding mounting ears)

height (all): 5.92 inches (15.04cm)
depth (all): 9.90 inches (25.15cm)

width

- 1011U and 1011UC: 17.00 inches (43.18cm)
- 1012U and 1012UC: 17.50 inches (44.45cm)
- 1013U and 1013UC: 20.40 inches (51.82cm)

weight

- 1011U: 5 pounds 12 ounces (2.61kg)
- 1012U: 6 pounds (2.72kg)
- 1013U: 6 pounds 6 ounces (2.89kg)
- 1014U: 6 pounds 11 ounces (3.03kg)
- 1011UC: 5 pounds 14 ounces (2.66kg)
- 1012UC: 6 pounds 1 ounce (2.75kg)
- 1013UC: 6 pounds 8 ounces (2.95kg)
- 1014UC: 6 pounds 13 ounces (3.09kg)

4. testing and troubleshooting

4.01 A predetermined procedure to test the wiring in an installed Type 10, Type 10 Universal, or Type 10 Connectorized Universal Shelf is impossible because of variance in wiring schemes. The shelf should be thoroughly physically inspected before mounting, however, to ensure that there are no bent or broken connector pins or other visible defects. If trouble is encountered in an operational shelf, ensure that all modules are seated properly and operating correctly and that all wiring is correct. If a shelf is suspected of being defective, a new one should be substituted and the test conducted again. If the substitute operates correctly, the original should be considered defective and returned to Tellabs for repair or replacement as directed below. We strongly recommend that no internal (component-level) testing or repairs be attempted on Tellabs equipment. Unauthorized testing or repairs may void its warranty. Also, if the equipment is part of a registered system, unauthorized repairs will result in noncompliance with Parts 15 and/or 68 of the FCC Rules and Regulations.

Note: Although repair service always includes an attempt to remove any permanent markings made by customers on Tellabs equipment, the success of such attempts cannot be guaranteed. Therefore, if equipment must be marked **defective** or **bad**, we recommend that it be done on a piece of tape or on a removable stick-on label.

technical assistance via telephone

4.02 If a situation arises that is not covered in the **testing guide checklist**, contact Tellabs Customer Service as follows:

USA customers: Contact your Tellabs Regional Office listed below.

region	telephone	office location
US Atlantic	(203)798-0506	Danbury, CT
US Capital	(703)359-9166	Washington, DC
US Central	(312)357-7400	Chicago, IL
US Southeast	(305)834-8311	Orlando, FL
US Southwest	(214)869-4114	Dallas, TX
US Western	(714)850-1300	Orange County, CA

Canadian customers: Contact our Canadian headquarters in Mississauga, Ontario. Telephone (416)624-0052.

International customers: Contact your Tellabs distributor.

selecting correct product service procedure

4.03 If equipment is diagnosed as defective or if in-service equipment needs repair, follow the **product return procedure** in paragraph 4.04 in all cases except those where a critical service outage exists (e.g., where a system or a critical circuit is down and no spares are available). In critical situations, or if you wish to return equipment for reasons other than repair, follow the **product replacement procedure** in paragraph 4.05.

product return procedure (for repair)

4.04 To return equipment for repair, first contact Tellabs Product Services (see addresses and numbers below) to obtain a Material Return Authorization (MRA). A service representative will request key data (your company's name and address, the equipment's model and issue numbers and warranty date code, and the purchase order number for the repair transaction). The service representative will then give you an MRA number that identifies your particular transaction. After you obtain the MRA number, send the equipment prepaid to Tellabs (attn: Product Services).

in the USA:

Tellabs, Inc.
4951 Indiana Avenue
Lisle, Illinois 60532
telephone (312)969-8800

in Canada:

Tellabs Communications Canada, Ltd.
1200 Aerowood Drive, Unit 39
Mississauga, Ontario, Canada L4W 2S7
telephone (416)624-0052

Enclose an explanation of the malfunction, your company's name and address, the name of a person to contact for further information, and the purchase order number for the transaction. Be sure to write the MRA number clearly on the outside of

the carton being returned. Tellabs will inspect, repair, and retest the equipment so that it meets its original performance specifications and then ship the equipment back to you. If the equipment is in warranty, no invoice will be issued. Should you need to contact Tellabs regarding the status of a repair, call or write the Product Services department at our Lisle or Mississauga headquarters as directed above.

product replacement procedure

4.05 For critical service outages, Tellabs offers a choice of two replacement services (if the product is in replacement stock) in lieu of the 15-day repair and return service described above. These are **overnight express service** (at extra cost) anywhere in the USA and **five-day expedited delivery** (at no extra cost) anywhere in the USA and Canada. To obtain replacement equipment via either of these services, contact your Tellabs Regional Office in the USA or our Canadian headquarters in Mississauga, Ontario, for details, costs (if applicable), and instructions. Telephone numbers are given in paragraph 4.02. A service representative will request key data (your company's name and address, the equipment's model and issue numbers and warranty date code, and the purchase order number for the replacement transaction). Tellabs will then ship the replacement to you in accordance with the replacement service you request. An invoice in the amount of the replacement's current price plus any applicable service charges will be issued after the replacement is shipped. When you receive the replacement, pack the equipment to be returned in the replacement's carton, sign and enclose the packing list, affix to the carton the preaddressed label provided, and ship the carton prepaid to Tellabs at our USA or Canadian headquarters. When we receive the defective equipment (within 30 days of our issuing the replacement), the invoice will be adjusted to reflect only service charges (if applicable). Please note that OEM, modified, and manufacture-discontinued equipment is not available via overnight express service.