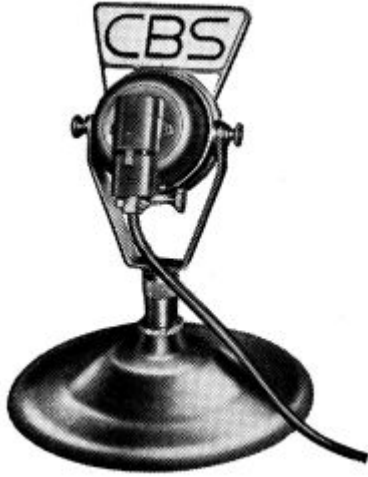


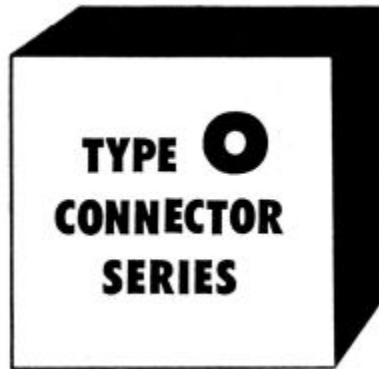
# A brief history of the XLR connector

By  
Ray A. Rayburn

Edited 12/14/2008

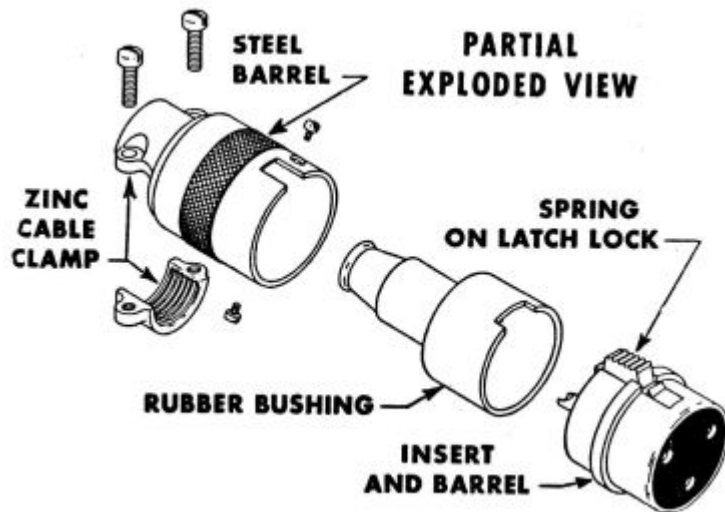


CBS microphone.

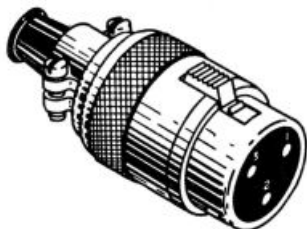
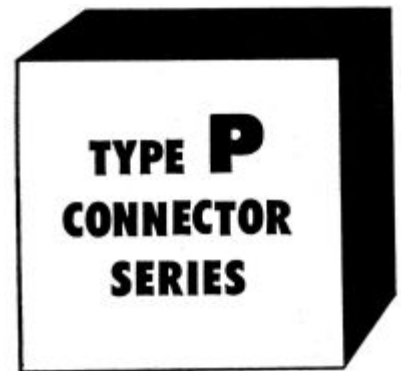


O3-11 connector.

Before my time in the audio industry Cannon (now ITT Cannon) made a Type O connector with an oval shaped body. The Cannon RJC-8-1955 catalog said "This series consists of a line of 3-contact oval-shaped plugs and receptacles, equipped with Latch Locking Device. Contacts are silver-plated, full-floating, non-twisting, with a 30 a. current rating. Solder terminals are tinned for ease of wiring. 30 a. contacts accommodate No. 10 stranded wire. 2400 v. flashover." While Cannon sold these for microphones, they were no longer in use when I started in audio in the early 1960's.



Exploded view of P-CG-11S.



P-CG-11S connector.



P-CG-12S connector.

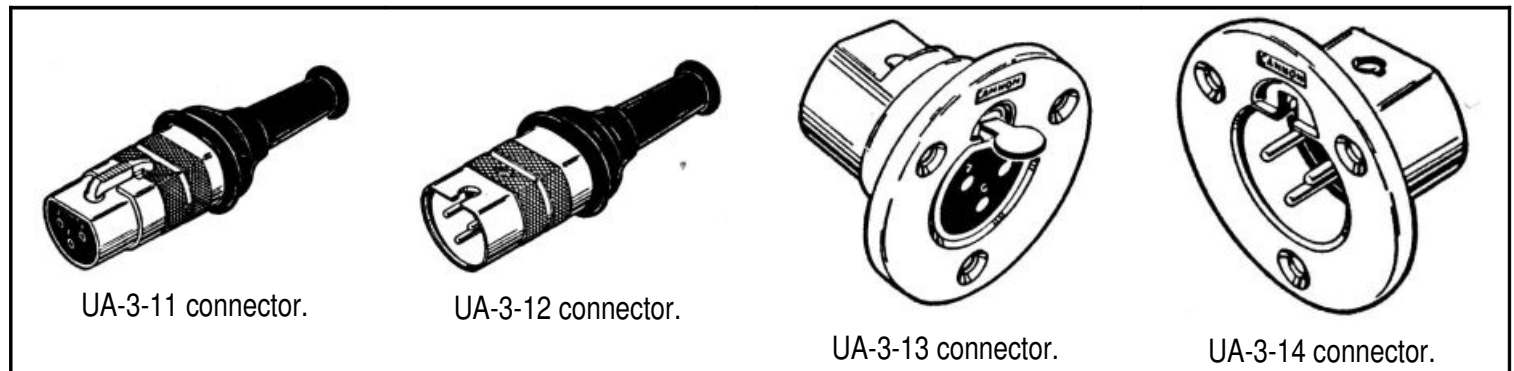
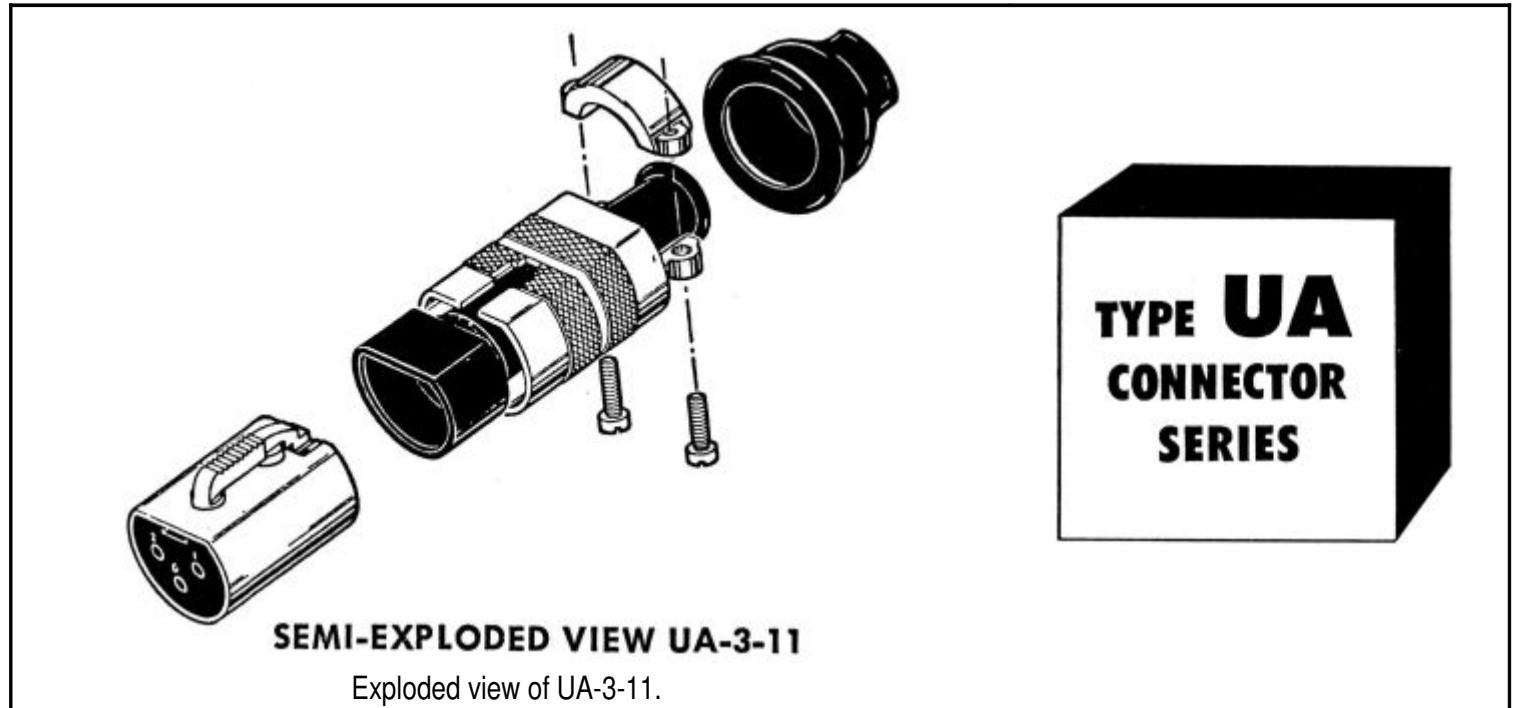


P-13 connector.



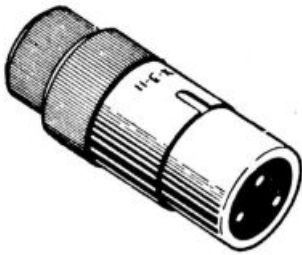
P-14 connector.

At one time Cannon made a large circular connector series that was popular for microphones called the P series. It was over an inch in diameter and heavy, but quite rugged. Mics used the 3 pin P3 version. The Cannon RJC-8-1955 catalog said “Universally used in sound and allied applications. ... Two to 6 contact inserts accommodate No. 10 B&S stranded wire; 8 contact insert No. 14 wire.” When I worked for RCA Records in NYC in the mid 1970's they were still using these connectors for microphones. Amphenol still makes this connector as the EP series with a metal shell and the AP series with a plastic shell. Some loudspeakers use the P4 (4 pin) or P8 (8 pin) versions of this connector to this day. When Neutrik developed the Speakon connector, they made versions that would fit the same mounting holes as the P series panel mount connectors to allow easy retrofitting with the more modern and far less expensive connector.

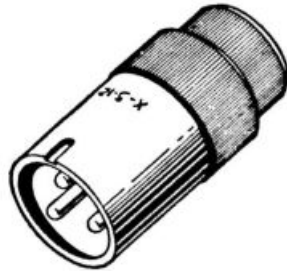


In an attempt to make a smaller connector for the microphone market Cannon came out with the UA series. These were “D” shaped instead of circular and were used on such mics as the Electro-Voice [666](#), [666R](#), and [655C](#). The Cannon RJC-8-1955 catalog said “The UA Series of audio connectors, designed in co-operation with the RETMA Committee, has all the features of Type P, O, and XL plus the following: (1) gold-plated contacts for long life and 'no noise' (2) double protection rubber relief collar and rubber bushings (3) flat-top polarization for finger-touch action (4) stronger and better latch lock (5) steel plug shells and insert barrel (6) spring-action insert removal - no screws.” The contacts were “only” rated at 15 Amps and would accept # 14 stranded wire.

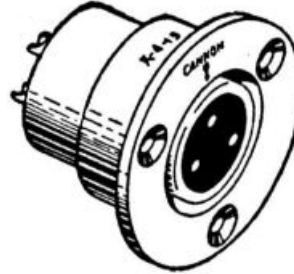
# TYPE X CONNECTOR SERIES



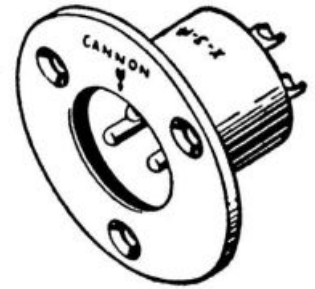
X-11 connector.



X-12 connector.

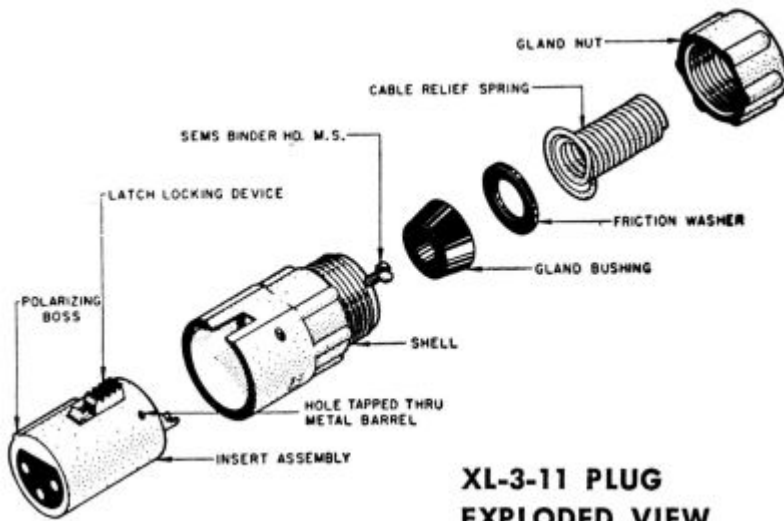


X-13 connector.



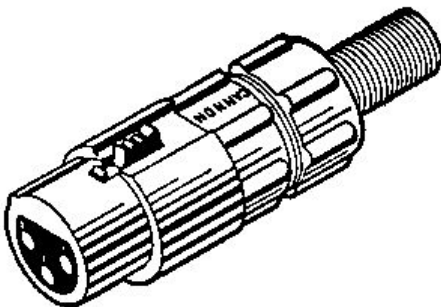
X-14 connector.

There was a desire for a smaller yet connector. Someone pointed out the small circular Cannon X series. The problem with this was it had no latch.

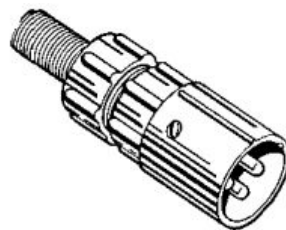


Exploded view of XL-3-11.

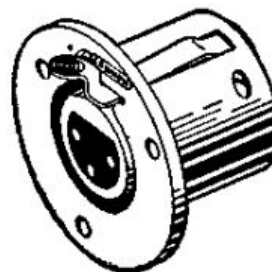
# TYPE XL CONNECTOR SERIES



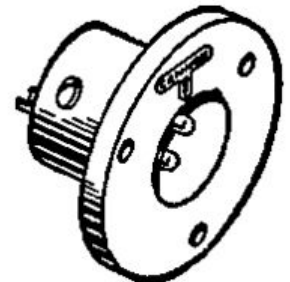
XL-3-11 connector.



XL-3-12 connector.



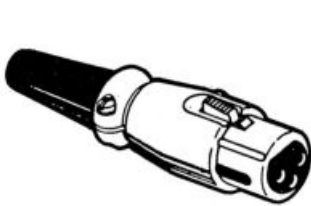
XL-3-13 connector.



XL-3-14 connector.

Cannon rearranged the pins and added a latch, and the XL (X series with Latch) was born. One of the great features of this connector is that the female pin 1 contact was placed forward in the shell and thus made connection first and broke connection last. Since pin 1 was used for the cable shield this greatly reduced the chance for hum or buzz as connectors were plugged and unplugged. This is the connector others such as Switchcraft and later Neutrik have copied.

# TYPE **XLR** CONNECTOR SERIES



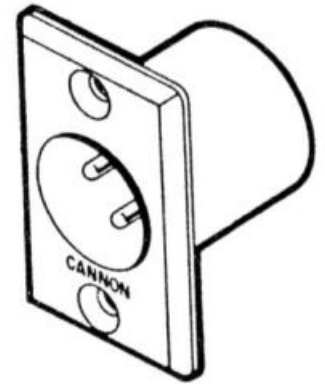
XLR-3-11C connector.



XLR-3-12C connector.



XLR-3-31 connector.



XLR-3-32 connector.

Later Cannon modified the female end only to put the contacts in a Resilient polychloroprene compound. They called this new version the XLR series. No other company has copied this feature. It is amusing that XLR has become the generic term since what everyone else copied was the XL and not the XLR! The XLR line also was the first to introduce smaller rectangular flanges on the panel mounting versions of the connector. This allowed a higher density of connectors on a panel.

I was reminded that Cannon later made an XLP series which substituted a fairly hard Plastic for the Resilient compound around the female contacts. If you have any pictures or drawings of this connector or a catalog that shows it, please [email me](#).

In 1950, Ampex adopted a pin-2-return, pin-3-positive convention for the wiring of the XL type connector, which was quickly copied by other USA based manufacturers. The introduction to the AES14 Standard said "Nevertheless, the pin-2-positive polarity convention was adopted for all audio levels by manufacturers outside the USA and was standardized, explicitly for microphone use, in 1975 by the International Electrotechnical Commission in its Publication 268, Part 12. The USA National Committee of IEC did not object to approval of the standard. The convention was subsequently approved for all applications by the Society of Motion Picture and Television Engineers in its *Polarity for Analog Audio Magnetic Recording and Reproduction*, RP-134-1986, and by the European Broadcast Union in its *Conservation of the Polarity of Audio Signals in Radio and Television Production Installations*, EBU Technical Recommendation R50-1988. In its deliberations, the AES working group determined that a considerable majority of manufacturers and users in the USA are now following this convention. The group also determined that the designation XLR is now generic and carries no proprietary restrictions on its use." In 1990 the AES14 Standard settled on the use of the pin 2 high convention and ended years of confusion in the marketplace.

The AES14 Standard also determined that equipment outputs would always be on the male versions of the XLR, and inputs would always be on female versions of the XLR. Prior to this the custom in Japan was to use the opposite sexing for line level connections while following the rest of the world for microphone level connections.

The IEC Standardized the dimensions of the XLR type connector but specified a very loose tolerance for the distance from the end of the female contact carrier to the body of the connector. Switchcraft brand connectors (and copies of them from Asia) are made to the shorter end of the allowed tolerance range, while Neutrik brand connectors (and copies of them from Asia) are made towards the long end of the allowed tolerance range. At times this results in connectors that will not latch when manufacturers don't properly follow the IEC Standard for their male connectors.

Thanks to Rick Chin for the copy of the Cannon RJC-8-1955 catalog (scanned by N7RHU) from which the above illustrations and quotes were taken.

Copyright © 2001, 2002, 2003, 2007, 2008 by Ray A. Rayburn. All rights reserved. <http://www.soundfirst.com/xlr.html>

Mailing address: Ray A. Rayburn 1630A 30th Street #163 Boulder, CO 80301-1014