DECODER CONNECTOR FRAMES
EQUIPMENT DESIGN REQUIREMENTS
PANEL SYSTEMS

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of the decoder connector frame arranged for use with decoder-type senders and decoder connector frames arranged for use with pulse machine senders which have been modified for decoder operation in panel offices.

1.02 This specification is reissued to incorporate previous appendix changes.

Capacity

1.03 The capacity of a group of decoder connectors, using decoder-type senders, is 51 connectors mounted on 17 connector frames which are served by a minimum of three and a maximum of six decoders. Such a group of equipment is known as a decoder group. Each decoder connector is arranged for connecting the ten decoder senders of one send frame to anyone of the decoders in the group. A maximum of 510 senders can be served by one group of connectors.

1.04 The capacity of a decoder group, using pulse machine-type senders which have been modified for decoder operation, is 43 connectors mounted on eight decoder connector frames of five connectors each and one partially equipped decoder connector frame of three connectors. Each decoder connector serves the senders associated with two modified sender frames of either 5- or 6-sender capacity or a combination of the two. Each connector therefore serves ten, eleven, or twelve senders on a maximum of two frames and each decoder group serves from 430 to 516 senders. The reduction of the number of connectors from 51 to 43 per decoder group is due to the limitation of the decoder test frame which requires that connectors be tested in groups of three and that the last connector associated with the second group of three for each 5-capacity connector frame be left spare.

1.05 A combination of decoder connectors (three connectors per frame) for decoder senders, and decoder connectors (five connectors per frame) for modified senders, may be used in the same decoder group.

Description

1.06 The decoder connector frame is used in conjunction with decoder and sender frames for the purpose of connecting senders to decoders during the time required for the decoder to function in the process of setting up the circuits for a call. The framework is a single-sided steel structure 11 feet-6 inches high and 2 feet-6-3/4 inches wide. It uses channel uprights and is arranged to line up with panel-type frames. The relays are placed between the uprights as this has the advantage of permitting the use of standard ladder guards and end guards. It also has the advantage of making the terminals more accessible than if the relays were mounted on the front of the channels.

Decoder Connector Frame for Use With Decoder-type Senders

1.07 This frame is arranged to accommodate a maximum of three connectors providing a maximum of thirty senders access to a maximum of six decoders. A combined jack and fuse panel is located at the bottom of the frame approximately 10-1/2 inches from the floor. Six mounting plates with strip covers and two mounting plates per connector are mounted above the combined jack and fuse panel. Nine rows of 287-type multicontact relays are located above the mounting plates. A framework accommodating twelve 232A terminal strips is located at the top of the frame. Two CA6A-type

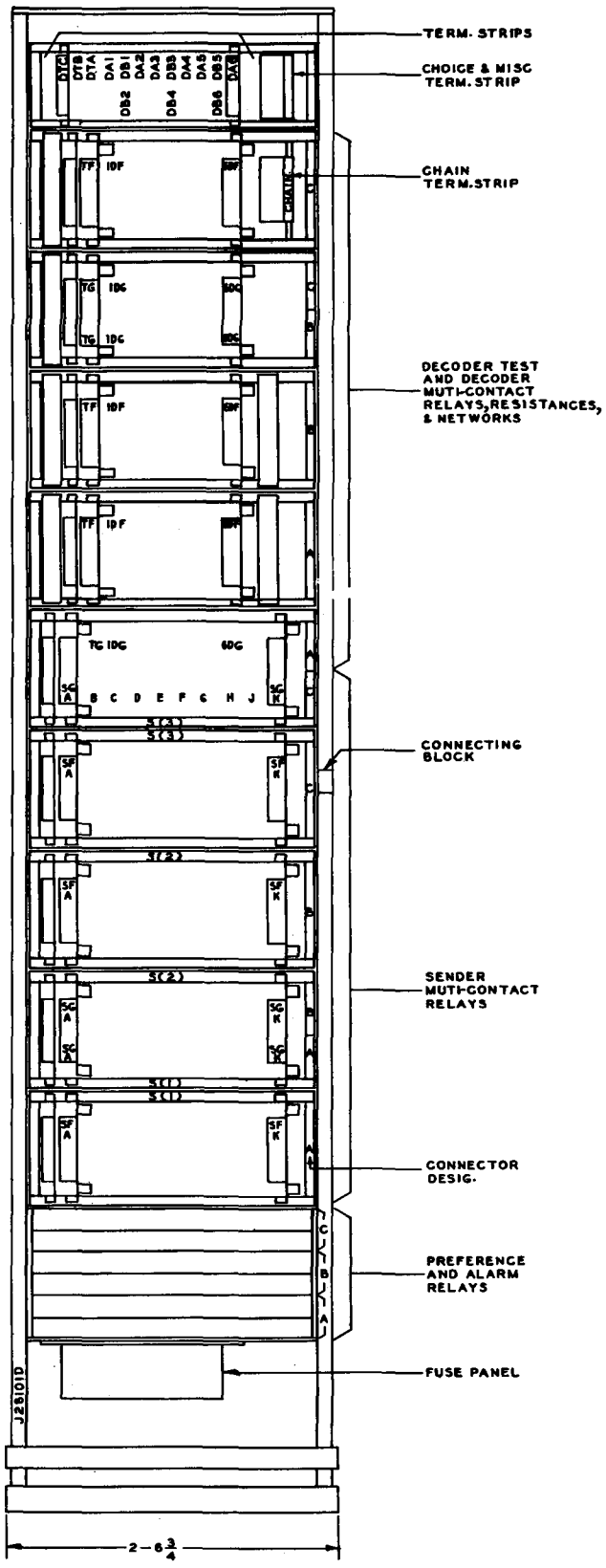

Fig. 1 – Decoder Connector Frame — 3-connector Capacity

terminal strips, mounted one below the other, are located at the right side of the two top framework assemblies. One and one half 287-type multicontact relays are required for the decoder test frame for each sender and for each decoder in the connector. One U-type relay per sender, two U-type relays and one resistance per decoder, and five U-type connector alarm relays along with associated contact protector networks are also required for each connector.

Decoder Connector Frame for Pulse Machine-type Senders Which Have Been Modified for Use With Decoder Equipment

1.08 The conversion of pulse machine-type senders for decoder operation provides for the replacement of the translator, pulse machine, and pulse machine fuseboard with decoder equipment.

1.09 This connector frame is arranged for five connectors, A, B, C, D, and E, wired as a single unit but equipped as required. Each connector consists of seven multicontact relays and four mounting plates of miscellaneous relay equipment. The upper six multicontact relays provide for connection to the decoders and the other multicontact relay serves the decoder test frame. The four mounting plates of miscellaneous relays consist of alarm relays for the connector and control relays for the connector and associated senders. Instead of multicontact relays in the connector to provide for connection to the sender, E- and R-type relays in the sender are used for this purpose. Approximately six control leads are required from each sender to its associated connector and about 56 leads which are common to each connector and to two modified sender frames of 5- or 6-sender capacity. The decoder and decoder test multicontact relays are multipled through all connectors.

2. SUPPLEMENTARY INFORMATION

815-000-000 — Panel Systems Index
AA128.006 — List of General Equipment Requirements Sections
J20102 (815-030-150) — Switchboard Power Cabling
E-1376 — Checking List for J specifications
Floor Plan Data — Section 4.14, Sheet 5

3. DRAWINGS

WECo J drawings listed should be ordered by referring to the prefix and base number and requesting the highest suffix dash (–) number.

Keysheets — Panel Systems

SD-21300-01 — Battery on C.O. Relay Offices
SD-21680-01 — Ground on C.O. Relay Offices
ES-262532 — 3-digit Sender Selector-type Offices
ES-262829 — 3-digit Rotary Link — Grd on C.O. Relay Offices

Framework

ED-20174-14 — Assembly of Frame — 5-conn. Capacity
ED-20175-10 — Relay Casing Assembly — 5-conn. Capacity
ED-20509-56 — Assembly of Fuse Panel — 5-conn. Capacity
ED-20616-51 — Assembly of Combined Jack and Fuse Panel — 3-conn. Capacity
ED-20917-50 — Assembly of Frame — 3-conn. Capacity

Equipment

J28101C-( ) — Decoder Connector Frame Equipment — 5-conn. Capacity — For Use With Pulse Machine-type Senders of 5 Capacity Sender Frames Modified For Decoder Operation
J28101D-( ) — Decoder Connector Frame Equipment — 3-conn. Capacity — For Use With Decoder-type Senders — Battery or Ground on Cutoff Relay

Wiring & Cabling

ED-20146-01 — Cabling Schematic for Decoder Equipment — 3-conn. Capacity
ED-20622-01 — Method of Running Frame Battery and Ground Leads
ED-20811-01 — Switchboard Power Cable
ED-20855-01 — Local Cable — 5-conn. Capacity
ED-20857-01 — Cabling Schematic for Decoder Equipment — 5-conn. Capacity
ED-20858-01 — Switchboard Cabling Plan — 5-conn. Capacity
ED-20919-01 — Local Cable — 3-conn. Capacity
ED-20920-01 — Switchboard Cabling Details — 3-conn. Capacity
ED-25100-01 — General Switchboard Cabling Practices — 3-conn. Capacity

4. EQUIPMENT

J28101C (A&M Only) — Decoder Connector Frame for Use With Only 5-sender Capacity Sender Frames

Equipment — J28101C-( )
Local Cable — ED-20855-01

List 1 — Framework, assembly, wiring, and common equipment for one decoder-connector frame wired for five connectors and arranged for use with 5-sender capacity sender frames which have been modified for decoder operation as follows:

	WIRE	EQUIP	SEE NOTES
Framework, ED-20174-14		1	
Relay Casing, ED-20175-10		5	
Fuse Panel, ED-20509-56, Fig. 5		1	
Decoder Connector Ckt, SD-21187-02:			
Test Rels, Fig. 3	5	0	
Sdr Rels (Sdr A of Low No. Sdr Frame), Fig. 4	5	0	
Sdr Rels (Sdrs B to E of Low No. Sdr Frame and Sdrs A to D of High No. Sdr Frame), Figs. 5 & 6	40	0	A
Sdr Rels (Sdr E of High No. Sdr Frame), Fig. 6	5	0	
Dr Rels (DR1), Fig. 7	5	0	
Dr Rels (DR2), Fig. 8	5	0	
Dr Rels (DR3 to DR5), Figs. 8 & 9	15	0	
Dr Rels (DR6), Fig. 9	5	0	
Miscellaneous Ckts, SD-21252-01:			
Fuse Alarm, Fig. 1	1	1	
Tel Jack, Fig. 2	1	1	
Spare Jack, Fig. 3	1	1	
Frame Test Bat., Fig. 4	1	1	
Remote Control Jack, Fig. 5	1	1	

List 2 — Equipment required in addition to list 1 to arrange one connector for use with one sender.

List 3 — Equipment required in addition to list 1 to arrange one connector for use with one decoder.

Notes

A. Leads in Fig. 5 for senders B to E of the low-numbered sender frame shall be looped at the positions of the SS, SF, SG, and SH relays to permit skipping a sender due to a partially equipped sender frame.

J28101D (A&M Only) — Decoder Connector Frame for Use With Decoder-type Senders

Equipment — J28101D-( )
Local Cable — ED-20919-01

List 1 — Framework, assembly, wiring, and common equipment for one decoder connector frame arranged for three decoder connectors with a maximum of six decoders and ten senders each.

	WIRE	EQUIP	SEE NOTES
Framework, ED-20917-50		1	J
Combined Jack & Fuse Panel, ED-20616-51, G-3		1	
Decoder Connector Ckt, SD-21967-01:			
Connector Alarm Ckt, Fig. 2	3	0	
Testing Ckt Conn. Relay, Fig. 3	3	0	A
Sender Preference Relay, Fig. 4	30	0	B
Sender Conn. Relay, Fig. 5	30	0	C
Decoder Preference Relay, Fig. 6	18	0	D
Decoder Conn. Relay, Fig. 7	18	0	C
Miscellaneous Ckts, SD-21252-01:			
Fuse Alarm, Fig. 1	1	1	
Tel Jack, Fig. 2	1	1	
Spare Jack, Fig. 3	1	1	
Frame Test Bat., Fig. 4	1	1	
Remote Control Jack, Fig. 5	1	1	

List 2 — Framework, assembly, equipment, and horizontal strapping required in addition to list 1 to partially equip decoder connector A or B for decoders 1 and 2, senders A and B, and the associated preference circuits (See note E.)

	WIRE	EQUIP	SEE NOTES
Mounting Assembly, EP-330199		2	
Decoder Conn. Ckt, SD-21967-01:			
Connector Alarm Ckt, Fig. 2		1	
Testing Ckt Conn. Rel, Fig. 3, Less TG Relay and Network	1	1	F
Sender Preference Relay, Fig. 4		2	
Sender Conn. Rel, Fig. 5, Less SG Relay and Network	2	2	F
Decoder Preference Relay, Fig. 6		2	
Decoder Conn. Rel, Fig. 7, Less DG Relay and Network	2	2	F,G,H

List 3 — Framework, assembly, equipment, and horizontal strapping required in addition to list 1 to partially equip decoder connector C for decoders 1 and 2, senders A and B, and the associated preference circuits. (See note E.)

	WIRE	EQUIP	SEE NOTES
Mounting Assembly, EP-330199		2	
Decoder Conn. Ckt, SD-21967-01:			
Connector Alarm Ckt, Fig. 2		1	
Testing Ckt Conn. Rel, Fig. 3, Less TG Relay and Network	1	1	F
Sender Preference Relay, Fig. 4		2	
Sender Conn. Rel, Fig. 5, Less SG Relay and Network	2	2	F
Decoder Preference Relay, Fig. 6		2	
Decoder Conn. Rel, Fig. 7, Less DG Relay and Network	2	2	F,G,H

List 4 — Framework, assembly, equipment, and horizontal strapping required in addition to list 2 to complete connectors A and B for senders A and B.

	WIRE	EQUIP	SEE NOTES
Mounting Assembly, EP-330199		1	
Decoder Conn. Ckt, SD-21967-01, Sender-Conn. Rel, Fig. 5, SG Relay and Network Only	2	2	F

List 5 — Framework, assembly, equipment, and horizontal strapping required in addition to list 2 to complete connector A for the testing circuit, decoders 1 and 2 and partially equip connector B for senders A, B, C, and D.

	WIRE	EQUIP	SEE NOTES
Mounting Assembly, EP-330199		1	
Decoder Conn. Ckt, SD-21967-01:			
Testing Ckt, Conn. Rel, Fig. 3, TG Rel & Network Only	1	1	F
Sender Conn. Rel, Fig. 5, SG Rel. & Network Only	4	4	F
Decoder Conn. Rel, Fig. 7, DG Rel & Network Only	4	4	F

List 6 — Framework, assembly, equipment, and horizontal strapping required in addition to list 2 to complete connectors B and C for decoders 1 and 2.

	WIRE	EQUIP	SEE NOTES
Mounting Assembly, EP-330199		1	
Decoder Conn. Ckt, SD-21967-01:			
Testing Ckt Conn. Rel, Fig. 3, TG Rel. & Network Only	1	1	F
Decoder Conn. Rel, Fig. 7, DG Rel and Network Only	2	2	F

List 7 — Apparatus per two Figs. 5 of SD-21967-01, less SG relays and networks, and two Figs. 4 required in addition to list 2 to partially equip one decoder connector for two additional senders.

List 8 — Apparatus per two Figs. 5 of SD-21967-01, SG relays and networks only, required in addition to lists 2, 4, and 7 to complete connectors A and B for two additional senders.

List 9 — Apparatus per SD-21967-01, Fig. 7, less DG relay and network and Fig. 6, required in addition to list 2 or 3 to provide partially for each additional decoder (3, 4, 5, or 6).

List 10 — Apparatus per SD-21967-01, Fig. 5, SG relay and network only, and Fig. 7, DG relay and network only, required in addition to lists 5, 7, and 9 to complete connectors A and C for decoders 3 and 4 and senders E and F, or for decoders 5 and 6 and senders G and H, respectively.

List 11 — Apparatus per SD-21967-01, Fig. 5, SG relay and network only, required in addition to lists 5, 7, and 10 to complete connector C for senders J and K.

List 12 — Apparatus per SD-21967-01, Fig. 7, DG relay and network only, required in addition to lists 6 and 9 to complete provision for each of decoders 3, 4, 5, or 6 in connectors B and C.

List 13 — Vertical multiple cable and apparatus required for each equipped odd decoder per decoder connector frame.

	WIRE	EQUIP	SEE NOTES
DA- & DB- Term. Strips		1	
Decoder Conn. Ckt, SD-21957-01, Fig. 7	3	0	H,I

List 14 — Vertical multiple cable and apparatus required for each equipped even decoder per decoder connector frame.

	WIRE	EQUIP	SEE NOTES
DA- Term. Strip		1	
Decoder Conn. Ckt, SD-21967-01, Fig. 7	3	0	H,I

Notes

A. The local cable leads to the testing circuit connector multicontact relays are furnished as part of list 1 and are contained in two local cables. One local cable is run vertically in back of the testing circuit connector multicontact relays in each connector and contains the multiple leads between these relays and the associated DTA and DTB terminal strips. All other local cable leads to these relays are contained in the regular frame local cable.

B. The wiring for the sender preference relays shall be arranged so that circuits B to J may be used as an intermediate or last circuit in a decoder connector.

C. The wiring to be furnished as part of this list shall be for the contact protection networks and other leads to the multicontact relays which are run in the frame local cable. The horizontal bare wire strapping for the multicontact relay is furnished as part of other lists.

D. The wiring for the decoder preference relays shall be arranged so that circuits 2 to 5 may be used as an intermediate or last circuit in a decoder connector.

E. One set of equipment per list 2 shall be provided for each of connector A or B and one list 3 for connector C.

F. The horizontal bare wire strapping for the testing circuit connector relays and maximum of six decoder connector and ten sender connector relays shall be furnished as part of lists 2, 3, 4, 5, and 6. When these relays are only partially equipped, the strapping shall be continued beyond the last unequipped position and supported at that position and insulated as illustrated in cabling and wiring Section AA612.019.

G. The local cable leads to these relays are provided in list 1 and the multiple wiring for the decoder-connector multicontact relays is provided in lists 13 and 14.

H. The multiple wiring per list 13 is a vertical cable form which is individual to and the same for each odd decoder in the connector. One end of the form shall be soldered to the corresponding DA- and DB- multicontact relay-type terminal strips which are mounted above the decoder connector relays on framework which is furnished as part of list 1. The multiple wiring per list 14 is

similar to list 13 and is the same for each even decoder in the connector. The DB- terminal strips furnished as part of list 13 are used partly for list 13 and partly for list 14.

I. On a decoder connector frame equipped with less than three decoder connectors, the multiple leads to the unequipped testing circuit and decoder connector relays shall be looped but not cut at the positions of the relays in unequipped decoder connectors.

J. A fully equipped decoder connector frame arranged for the maximum of thirty senders and six decoders consists of the following:

1 - list 1	1 - list 6	1 - list 11
2 - list 2	12 - list 7	4 - list 12
1 - list 3	4 - list 8	3 - list 13
1 - list 4	12 - list 9	3 - list 14
1 - list 5	2 - list 10	

5. GENERAL NOTES

Equipment Notes

5.01 Each connector of the 3-capacity decoder connector frame is arranged to serve one sender frame of ten decoder senders. One and one-half multicontact relays are required in the connector for each associated sender with like-lettered senders appearing in the same relative location in each connector. The connector shall be arranged to serve one sender frame regardless of partially equipped sender frames which might occur.

5.02 Each connector of the 5-capacity connector frame is arranged to serve two sender frames of 5- or 6-sender capacity. In place of multicontact relays in the connector for connecting the senders to a decoder, existing E- and R-type relays in the sender are used. Four control relays are required in the connector for each associated sender. These relays per senders A to E of the low- and the high-numbered sender frames are located on separate mounting plates. The control relays for the F senders of both sender frames are located on a mounting plate with other connector equipment. These relays for the F senders are wired for J28101B and equipped as required but are not wired or equipped for J28101C as this type of connector frame is not arranged to serve sender frames with 6-sender capacity.

5.03 The 3-capacity decoder connector frame shall be equipped in consecutive order from bottom up and the sender and decoder connector relays from left to right. Equipping sender and decoder connector relays from left to right provides the best arrangement for the extension of the horizontal bare strapping past the unequipped positions and facilitates changes in the multiple on additions. The 5-capacity frame shall also be equipped in consecutive order. However, where the floor plan arrangement or other reasons make it desirable, connectors may be omitted from the 5-capacity frame.

5.04 There shall be a minimum of four connectors on two connector frames arranged for a minimum of three decoders in any one office.

5.05 The senders of any one sender group should be served by connectors on at least two connector frames.

5.06 On the 5-capacity connector frame for use with modified pulse machine-type senders, the local cable leads for the DF and DG relays of connector A shall be left disconnected by the shop. The switchboard cable leads shall be superimposed on the local cable form and the wiring for both forms connected by the installer.

5.07 The leads from the decoder test frame and those from the odd-numbered decoder frames shall be run to the lowest numbered decoder connector frame and multipled through the other decoder connector frames, while those from the even-numbered decoder frames shall be run to the highest numbered decoder connector frame and then multipled to the other connectors. In following this arrangement, the cables from the odd- and even-numbered decoder frames shall be routed over separate cable racks between line-ups of frames and these cable racks shall not be adjacent. This arrangement is followed in order to prevent putting out of service more senders than are served by a single decoder connector frame in the event that frames were put out of service.

5.08 When decoder connectors are added to an existing group of 5-capacity connector frames arranged for use with modified pulse machine type senders, it may be desirable to extend the decoder multiple from the decoder

frames instead of from the existing connector frames. No terminal strips are provided on the 5-capacity connector frames for the decoder leads which would make it necessary to extend the multiple from the connector multicontact relays.

5.09 When new decoder connectors, equipped with 287-type relays are ordered, No. 24 gauge, type "C" wire shall be used for the local wiring to these relays.

Bell Telephone Laboratories, Incorporated

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List of "A&M Only" and "Mfr Disc." Equipment

The following equipment has been replaced as indicated. Where "A&M Only" items appear, the issue numbers shown are those of the issue in which the rating was first applied.

EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
J28101A	Mfr Disc.	4	J28101D
J28101B	Mfr Disc.	6	—