SENDER MAKE-BUSY FRAME 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 manufacture and installation of the sender make-busy frame for use in local and tandem panel offices.

1.02 This specification is reissued:

(a) To rate J21801A Mfr Disc.

(b) To bring it into conformity with the general Plant Series plan.

Capacity

1.03 The sender make-busy frame for use with A switchboard has a capacity of 400 sender make-busy jack circuits, 400 sender service observing circuits, 40 sender frame busy circuits, 40 keypulsing sender make-busy circuits, and 20 lines to service observing desk. The capacity of 400 sender make-busy jack circuits will be reduced to 350 when this frame is arranged for use with senders that handle direct distance dialing calls in conjunction with an auxiliary sender. The sender make-busy frame for use in local offices without an A switchboard, where the senders are arranged for automatic priming after time-out, has a capacity of 280 sender make-busy jack, key, and lamp circuits, 20 sender make-busy frame jack circuits, 80 permanent signal holding trunk make-busy jack and lamp circuits for use with concentrating equipment, and 10 concentrating circuit make-busy jack and lamp circuits. The sender make-busy frame for use in offices without an A switchboard, where the senders are arranged for timed release, has a capacity of 200 sender make-busy jack circuits, 20 sender make-busy frame busy jack circuits, and 140 permanent signal holding trunk make-busy jack and lamp circuits with or without use with concentrating equipment. This frame is rated A&M Only and is replaced by the one used in offices where the senders are arranged for automatic priming after time-out.

Description

1.04 The sender make-busy frame is a steel structure of a type known as a single-sided frame consisting of a single bay. Its function is to provide a means for indicating when a subscriber sender is unduly held in service by a subscriber due to trouble in the sender or in the other circuits involved. The stuck sender signals in some local panel offices are transferred to the sender make-busy frame by the sender monitor operator located at the A switchboard. In other local panel offices that are served by a central A switchboard, the senders in the local offices, without an A switchboard, are either arranged for timed release or for automatic priming after time-out. With timed release senders, the subscriber receives a disconnect tone which, in effect, tells him to hang up his receiver and dial again. With automatic priming after time-out, the senders are automatically released and the disconnect tone is omitted. In both cases, a CTR key is provided per sender, which, when operated, opens the circuit which would automatically release the stuck sender. This permits the maintenance man to trace the stuck sender. When senders are arranged to handle direct distance dialing calls in conjunction with auxiliary senders, a make-busy jack, lamp, and cancel timed release key are provided for each auxiliary sender, plus a stuck sender register and all-senders-busy alarm lamp per group of auxiliary senders and a stuck sender alarm bell per sender make-busy frame. The keypulsing and tandem office signals are not under control of an operator. The make-busy jacks associated with the

sender frame make-busy circuits are also located on this frame together with associated auxiliary circuits and miscellaneous talking lines.

1.05 The sender make-busy frame is usually located adjacent to the sender test frame with the chief switchman desk close by.

2. SUPPLEMENTARY INFORMATION

815-000-000 — Panel Systems Index
AA128.006 — List of General Equipment Requirements Sections
E1376 — List of J Series Specifications
J29212 (815-071-151) — Sender Load Indicating Equipment
J95103 (815-200-151) — Auxiliary Sender Frame — For Panel and No. 1 Crossbar Systems — Direct Distance Dialing
J95104 (815-200-152) — Auxiliary Sender Link Frame — For Panel and No. 1 Crossbar Systems — Direct Distance Dialing
Floor Plan Data — Section 4.2, Sheet 2
Current Drain Data — SD-21300-01,02

3. DRAWINGS

WECo J drawings should be ordered by referring to the prefix and base number and requesting the current dash (—) number.

Keysheets

SD-21300-01 — Panel System
SD-21301-01 — Panel Tandem System

Framework

ED-20147-34 — Assembly of Frame
ED-20509-54 — Assembly of Fuse Panel
ED-20622-01 — Method of Running and Supporting Battery and Ground Leads
ED-90395-51 — Relay Rack Unit Assembly
ED-90416-10 — Key Mounting Assembly

Equipment

J21801C-( ) — Sender Make-Busy Frame — Local Panel Office — For Universal Trunks
J21801F-( ) — Permanent Signal Holding Trunk Unit — For Offices Without A Switchboard and Where Concentrating Circuit Is Not Used
ED-92867-( ) — Miscellaneous Relay Rack Equipment

Wiring and Cabling

ED-20148-01 — Switchboard Cabling Plan With A Switchboard
ED-20148-02 — Switchboard Cabling Plan Without A Switchboard
ED-20149-01 — Local Cabling Plan

Schematics

SD-21236-01 — Miscellaneous Frame Circuit
SD-21696-01 — Permanent Signal Hold Trunk Circuit
SD-21697-01 — Test Circuit
SD-21698-01 — Test Circuit
SD-21707-01 — Telephone Circuit
SD-96410-01 — Auxiliary Signal Circuit

4. EQUIPMENT

J21801C (A&M Only) — Sender Make-Busy Frame — Local Panel Office — For Universal Trunks

Equipment — J21801C-( ) (see 5.01 and 5.05)
Local Cable — ED-20149-01

List 1 — Framework, assembly, wiring, and equipment for a sender make-busy frame for local panel offices with A switchboard with sender monitoring operation.

	WIRE	EQUIP	SEE NOTES
Framework, ED-20147-34, G1		1	
Fuse Panel, ED-20509-54, G1		1	5.06
Key Mounting, ED-90416-10		2	
Key-Ended Trunk Ckt, SD-21707-01, Fig. 2 & 3 (Two Ckts per Key)	14	0	5.02
Tel Ckt, SD-21707-01, Fig. 1 & B	1	1	
Misc Frame Ckt, SD-21236-01:			
Fuse Alm Ckt and Frame Test Bat. Ckt, Fig. 1 & 3	1	1	
Sdr Make-Busy Jack Ckt, Fig. 4	400	0	5.04 5.06
Sdr Frame Make-Busy Ckt, Fig. 7	40	0	
KP Sdr Make-Busy Ckt, Fig. 14	40	0	
KP Sdr Aux Relay Ckt, Fig. 17	2	0	

	WIRE	EQUIP	SEE NOTES
KP Sdr Buzzer Ckt, Fig. 18	1	0	
Link Down Drive Alm Ckt, Fig. 10 & 19	4	0	
Link Down Drive or Sdr Load Indicating Alm Release Key Ckt, Fig. 11	1	1	
Stuck Sdr Register Ckt, Fig. 32	4	0	
Double Connection Detection Ckt, Fig. 29	2	0	
Aux Sig Ckt, SD-96410-01:			
Fig. 1	1	1	
Fig. 2 (Y App)	1	1	
Fig. 5 (W or X App)	1	0	

List 2 — Framework, assembly, wiring, and equipment for a sender make-busy frame for local panel offices without an A switchboard, for use with senders arranged for automatic priming after time-out, and arranged for permanent signal holding trunks with concentrating equipment (see 5.01).

	WIRE	EQUIP	SEE NOTES
Framework, ED-20147-34, G1		1	
Fuse Panel, ED-20509-54, G1		1	5.06
Key Mounting, ED-90416-10		2	
Key-Ended Trunk Ckt, SD-21707-01, Fig. 2 & 3 (Two Ckts per Key)	14	0	5.02
Tel Ckt, SD-21707-01, Fig. 1 & A	1	1	
Test Ckt, SD-21697-01	1	1	
Test Ckt, SD-21698-01	4	0	
Aux Sig Ckt, SD-96410-01:			
Fig. 1	1	1	
Fig. 2 (Y App)	1	1	
Fig. 5 (W or X App)	1	0	
Misc Frame Ckt, SD-21236-01:			
Fuse Alm Ckt, Fig. 1	1	1	
Frame Test Bat. Ckt, Fig. 3	1	1	
Sdr Make-Busy Jack and Lamp Ckt, Fig. 4, With R App	280	0	
Sdr Frame Make-Busy Ckt, Fig. 7	40	0	
Link Down Drive Alm Ckt, Fig. 10 (Less B Wiring)	4	0	
Release Key Ckt, Fig. 11	1	1	
Time Alm Ckt for Automatic Priming, Fig. 22	1	1	
(CTR) Key Ckt, Fig. 24	280	0	
Perm Sig Hold. Trk Jack and Lamp Ckt, Fig. 26	80	0	
Concentrating Ckt for Perm Sig Hold. Trk Make-Busy Jack and Lamp Ckt, Fig. 25	10	0	
Stuck Sdr Register Ckt, Fig. 32	4	0	
Double Connection Detection Jack Ckt, Fig. 29	2	0	
Overflow Alm for Perm Sig Trk Group, Fig. 30 or Perm Sig Alm Ckt Control Keys and Guard Lamp, Fig. 33	2 1	0 0	

List 3 — Wiring and equipment required in addition to list 2 when sender make-busy frame serves subscriber senders that are arranged to handle direct distance dialing calls in conjunction with auxiliary senders.

	WIRE	EQUIP	SEE NOTES
Miscellaneous Circuit for Sender Make-Busy Frame, SD-21236-01:			
Aux Sdr Make-Busy Jack and Cancel Timed Release Key, Fig. 35	40	0	
Aux Sdr Stuck Sdr Lamp, Fig. 36	40	0	5.16
Aux Sdr Stuck Sender Bell, Fig. 37	1	1	
Aux Sdr Stuck Sdr Register and All-Sdrs-Busy Alm Lamp, Fig. 38	4	0	

List 4 — Equipment per SD-21236-01, Fig. 35 and 38, required in addition to list 3 for each group of ten or less auxiliary senders served by same sender make-busy frame. (See 5.16.)

List 5 — Equipment for ten auxiliary sender stuck sender lamp circuits per SD-21236-01, Fig. 36, required in addition to list 3 for each group of ten or less auxiliary senders served by the sender make-busy frame. (See 5.16.)

List 6 — Equipment and wiring per SD-21697-01, Fig. F, required in addition to list 2 to provide for application of receiver off-hook tone to subscriber line if the receiver is not on the switch hook (see Note A).

Note

A. A new mounting plate is required in addition to list 6, when frame is equipped for four sender groups.

J21801F (A&M Only) — Permanent Signal Holding Trunk Unit — For Offices Without A Switchboard and Where Concentrating Circuit Is Not Used

Equipment and Local Cable — J21801F-( )

List 1 — Framework, assembly, wiring, and common equipment for a permanent signal holding trunk unit wired for ten trunks from the district multiple in offices with an A switchboard.

	WIRE	EQUIP	SEE NOTES
Framework, ED-90395-51, Fig. 1		1	
Perm Sig Hold Trunk Ckt, SD-21696-01, Fig. 1 With M, N, R, and T Wiring	10	0	A,C,D

List 2 — Equipment per SD-21696-01, Fig. 1, less Y apparatus and with N apparatus required in addition to list 1 for one trunk circuit, when automatic application of voice challenge announcement followed by receiver off-hook tone is not required.

List 3 — Equipment per SD-21696-01, Fig. 5, required in addition to list 1 to provide for automatic release of permanent signals caused by improper operation of 1A key equipment (see Note B).

List 4 — Equipment per SD-21696-01, Fig. 1, Y apparatus, required in addition to list 3 for each trunk circuit (see Note B).

List 5 — Equipment and wiring per SD-21696-01, Fig. 1, less N apparatus required in addition to list 1, when automatic application of voice challenge announcement followed by receiver off-hook tone is required.

Notes

A. The tone and timing circuit equipment covered by J21801F-( ), Fig. 3 shall be located on the relay rack above the trunk units covered by Fig. 1. The lead-covered tone conductor shall be grounded to the miscellaneous ground bar.

B. The FL- resistors, FL- capacitors, and FL relay (Y apparatus of Fig. 1 and Fig. 5) of SD-21696-01 are mounted as an installer-wired unit per J21801F-( ), Fig. 4. One of these units is furnished for each Fig. 1 and should be mounted as near as possible to the equipment of J21801F-( ), Fig. 2.

C. Connect T option when operation with automatic number identification (ANI) permanent signal identification is required, otherwise connect R option.

D. Connect M option when list 5 is furnished.

5. GENERAL NOTES

5.01 Equipment for sender monitor service observing covered by SD-21236-01, Fig. 5 and 6 shall be furnished only when specified. The equipment arrangement shown in J21801C-( ) is typical and may be varied to agree with job requirements.

5.02 The key-ended trunk circuits shall have the keys universally wired so that either a trunk circuit using one-half of the key or a trunk circuit using the whole key may be connected to any one of the keys. The relay equipment is located on the relay rack and cables either to the MDF or IDF for cross connection to the key and lamp equipment. These circuits are the same as those used on other frames or desks and may be a part of a group of trunks serving these frames or desks.

5.03 Referring to the equipment drawing it will be noted that a special width jack space has been specified between the sender make-busy equipment and the service observing equipment. This space has been left in order that the service observing patching cords will not drop across the make-busy equipment and cover the sender lamps.

5.04 Twenty circuit switchboard cables shall be installed between the sender make-busy frame and the sender frame SMDTS for the service make-busy equipment and the service observing equipment.

5.05 A spare unnumbered jack mounting shall be provided as a receptacle to accommodate spare make-busy plugs immediately below the bottom strip of equipped make-busy jacks.

5.06 One ground lead shall be furnished for each 40 sender make-busy circuits as shown on the equipment drawing.

5.07 Wiring for the battery lead for the lamp only shall be furnished, since the relays for these circuits are mounted on the relay rack.

5.08 The howler equipment required for the test circuit shall be furnished per J93016V and equipped with one circuit instead of two. This is a standard relay rack unit. The howler leads shall be in lead-covered cable and installed as covered in Note A of J93016V.

5.09 The auxiliary signal bell or buzzer circuits shall be equipped as specified by the telephone company. Associated relays, etc, per J93016 shall be equipped in accordance with job requirements. This equipment is shown in ED-92867-23 and is located on the miscellaneous relay rack.

5.10 One 24-volt battery and high resistance ground supply shall be provided from the miscellaneous fuse board in each office for the sender make-busy frame.

5.11 The B wiring of SD-21236-01, Fig. 10, and the wiring for Fig. 19 shall be superimposed on the bay local cable when required.

5.12 Additions to existing equipment shall be furnished to agree with the original installation. This is necessary since the telephone and auxiliary signal circuits furnished with code J21801C are arranged to function with the universal trunk and tie line circuits for all maintenance frames and desks and will not function with nonuniversal trunk and tie line circuits already installed.

5.13 The new codes cannot be used with existing OGT testboards or chief switchman desks for the reasons referred to under 5.12, unless the existing equipment is modified for use with the universal trunk and tie line circuits. It should further be noted that the new codes must be used with the chief switchman desk and OGT testboard covered by J24601 and J28502, Issue 3, since common trunks and tie lines are used for all three equipments.

5.14 The following equipment units are required for use with the sender make-busy frame per J21801C when permanent signal holding trunks are required to work with a concentrating circuit:

J99206AR — Concentrating Unit for Permanent Signal Holding Trunks
J99206AS — Permanent Signal Holding Trunk Unit
J99206AT — Timing Circuit, Tone Control, and Trunk
J99206AU — Howler Unit
J99235H — Test Trunk Selection Unit for Selecting Permanent Signal Holding Trunk
J99235J — Test Trunk Unit for Selecting Permanent Signal Holding Trunk

5.15 The equipment for the all-senders-busy time alarm circuit for auxiliary senders is installer-wired and is shown in relay rack equipment drawing, ED-92867-28. This equipment shall be furnished as required and mounted on the miscellaneous relay rack as near the sender make-busy frame as practicable.

5.16 A group of auxiliary senders may serve two groups of subscriber senders served by two sender make-busy frames. In this case the make-busy (MB) jacks, keys (CTR), and lamps (SS) shall be equipped on one frame as designated by the telephone company. However, it is essential for maintenance reasons that the stuck sender (SS) lamps be equipped on both

frames if they are not adjacent or very near to each other in the same maintenance center.

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
J21801A	Mfr Disc.	8	J21801C
J21801B	Mfr Disc.	6	—
J21801D	Mfr Disc.	6	—
J21801E	Mfr Disc.	7	J21801C,L2
J21801F	A&M Only	5	J99206AS

Bell Telephone Laboratories, Incorporated

Dept 5653