# TYPE "B" CX SIGNALING

# SIGNALING EQUIPMENT UNITS AND ASSOCIATED NETWORK EQUIPMENT

# FOR TRANSMITTING AND RECEIVING SUPERVISORY SIGNALS AND DIAL PULSES

# EQUIPMENT DESIGN REQUIREMENTS

# COMMON 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 type "B" CX signaling units and associated network equipment when required.

**1.02** This specification is reissued for the following reasons:

(a) To rate J98606A and J98606C "Mfr Disc.," to be replaced respectively by J98604E, L1 or J98604F, L1 and J98604C, L1 or J98604D, L1.

(b) To remove SD-95032-01, SD-95058-01, ED-91541-01, and ED-95058-01 from Part 3, Drawings.

Size of Equipment

**1.03** The sizes of the various units of equipment are as follows:

| CODE | INCHES |
|---|---|
| J98606B | 10-1/2 by 19 |
| J98606E, L1, L2, & L3 | 3-1/2 by 19 |
| L7 & L8 | 1-3/4 by 19 |
| L9 | 3-1/2 by 19 |
| L10 | 1-3/4 by 19 |
| L11, L12, L13, L14, & L15 | 3-1/2 by 19 |
| J98606G | 3-1/2 by 19 |
| J98606H, L1 or L3 | 1-3/4 by 19 |
| L4 | 3-1/2 by 19 |
| J98606J, L1, L2, & L3 | 7 by 19 |
| L4, L5, & L6 | 1-3/4 by 19 |
| J98606K | 7 by 19 |

### Description

**1.04** The signaling units covered in this specification provide a means for signaling and dialing over composite legs of composited physical or phantom open-wire or cable circuits.

**1.05** J98606B covers requirements for a type "B" CX signaling phantom group unit. The unit is used for CX signaling on short open wire, cable circuits, or combinations of open wire and cable with one intermediate telephone repeater. The maximum conductor loop resistance is 4400 ohms when 19 gauge cable is used on both sides of the repeater. This unit will operate only with CX sets in which 158-type retardation coils are used (type "C" CX sets).

**1.06** J98606E covers requirements for a type "B" CX signaling phantom group unit and associated network equipment. This circuit is used for 2-way signaling only. It is capable of passing supervisory flashes and rering pulses but it is not capable of passing dial pulses. The circuit is arranged for phantom or non-phantom group operation and earth potential variation and can be used with either type "C" or "E" CX sets. The basic signaling unit occupies the space of two 1-3/4-inch by 19-inch mounting plates, the lower plate providing for the test jacks. The networks for circuits not equipped with an intermediate repeater occupy the space of two mounting plates per phantom group. The networks for circuits equipped with an intermediate repeater occupy the space of one mounting plate per sig-

naling circuit or three mounting plates per phantom group. Thump reduction coils, when required, occupy an additional space of two mounting plates.

**1.07** J98606G covers requirements for a type "B" CX signaling unit. The unit is used for 2-way signaling and dialing with type "C" composite sets over short-haul cable and open-wire circuits without intermediate telephone repeaters or for use with type "E" composite sets over cable circuits with or without one intermediate telephone repeater. The circuit is arranged for phantom or nonphantom group operation and earth potential variation. This unit provides only the signaling equipment; the associated network equipment is covered under J98606H, as outlined in the following paragraph. Jacks for testing and maintenance are provided on the lower mounting plate of the unit. Surface wiring is used with all wiring terminating at terminal strips for external connections.

**1.08** J98606H covers requirements for the line-balancing network equipment for use with the J98606G signaling equipment covered in the previous paragraph. Three lists are provided under this code, as follows: List 1 provides the network for a signaling circuit used on a cable circuit equipped with type "E" composite set but without intermediate telephone repeater. List 3 provides the network for a signaling circuit used on an open-wire or cable circuit equipped with type "C" composite set but without intermediate telephone repeater. List 4 provides the network for a signaling circuit used on a cable circuit equipped with type "E" composite set and with one intermediate V1 telephone repeater. Each network per list 1 or 3 consists of a single mounting plate (1-3/4 inches by 19 inches) of single-side mounted apparatus which necessarily requires three plates per phantom group. The network per list 4 consists of two mounting plates (3-1/2 inches by 19 inches) of single-side mounted apparatus which requires six plates per phantom group. Surface wiring is used. All external connections are made directly at the apparatus involved.

**1.09** J98606J covers requirements for a type "B" CX signaling phantom group unit. These circuits are used for 2-way signaling and dialing with 45- to 50-volt battery over the CX legs of cable circuits having one intermediate telephone repeater. The basic signaling circuit provides for operation on loops having a maximum of 8000-ohm resistance. Optional equipment is provided which increases the range to loops having a maximum of 12,000-ohm resistance. This circuit may be used with type "C" or type "E" composite sets. When type "E" composite sets are used, the range is limited to 10,000-ohm loop. Type "E" composite sets cannot be used with 93-type repeating coils when using this signaling circuit. The circuit is arranged for phantom or nonphantom group operation and earth potential variation. This unit provides only the signaling equipment; the associated network equipment is covered under J98606K, as outlined in the following paragraph. Jacks for testing and maintenance are provided on the unit. Surface-type wiring is used, with all wiring terminating at terminal strips for external connection.

**1.10** J98606K covers requirements for the line-balancing network equipment for use with the J98606J signaling equipment covered in the previous paragraph. This network equipment is provided on a phantom group basis the same as the associated signaling equipment. Surface wiring is used. All external connections are made directly at the apparatus involved.

**Subdivisions of Equipment**

J98606B — AT&TCo Std — Type "B" 2-way Composite Signaling and Dialing Unit Equipment for Combination Open-wire and Cable Circuits With One Intermediate Voice Repeater — 48-volt Offices — Arranged for Earth Potential Compensation — Maximum Loop Resistance 4400 Ohms of Cable

J98606E — AT&TCo Std — Type "B" Composite Signaling Unit and Associated Network Equipment for 2-way Signaling Only Over Cable Circuits With or Without an Intermediate Repeater — Arranged for Phantom or Nonphantom Group Operation and Earth Potential Variation

J98606G — AT&TCo Std — Type "B" Composite Signaling Unit Equipment — For 2-way Signaling and Dialing With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits With-

out Intermediate Telephone Repeaters or for Use With Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater — Arranged for Phantom Group Operation and Earth Potential Variation

J98606H — AT&TCo Std — Type "B" CX Signaling Network Equipment for Use With the J98606G Signaling Unit — For Use With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits Without Intermediate Telephone Repeaters or for Use With Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater

J98606J — AT&TCo Std — Type "B" Composite Signaling Unit Equipment — For 2-way Signaling and Dialing Over Cable Circuits With One Intermediate Repeater — Maximum 12,000-ohm Loop Resistance — Arranged for Phantom or Nonphantom Group Operation and Earth Potential Variation

J98606K — AT&TCo Std — Type "B" CX Signaling Network Equipment for Use With the J98606J Signaling Equipment — For Use With Cable Circuits Having One Intermediate Repeater — Maximum 12,000-ohm Loop Resistance — Arranged for Phantom or Nonphantom Group Operation

## 2. SUPPLEMENTARY INFORMATION

800-600-000 — List of General Equipment Requirement Sections

801-000-000 — Equipment Design and General Equipment Requirements and Engineering Information — Common Systems

## 3. DRAWINGS

### Circuits

SD-55415-01 — Composite Signaling Circuit Type "B" — For 2-way Signaling and Dialing Over Cable Circuits With One Intermediate Repeater — Max Loop Resistance 12,000 ohms

SD-95048-01 — Type "B" Composite Signaling Circuit — For 2-way Signaling and Dialing for Use With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits Without Intermediate Telephone Repeaters or Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater

SD-95067-01 — Composite Signaling Circuit Type "B" — 2-way Signaling and 2-way Dialing Over Short-haul Cable and Open-wire Circuits With Intermediate CX Sets at an Intermediate Point — Arranged for Earth Potential Variation — For Use With Type "C" CX Sets Only

SD-95084-01 — Composite Signaling Circuit Type "B" — 2-way Signaling Over Cable Circuits — For Use With Circuits Requiring Passage of One Pulse Rering Signal

### Equipment

ED-55415-01 — Composite Signaling Type "B" — CX Signaling Equipment Unit and Associated Network Equipment — Phantom Group or Single Circuits — For 2-way Signaling and Dialing Over Cable Circuits With One Intermediate Repeater — Max 12,000-ohm Loop

ED-91680-01 — Composite Signaling Type "B" — CX Signaling Unit and Associated Network Equipment — Phantom Group or Single Circuit for 2-way Signaling Over Cable Circuits — For Use With Circuits Requiring Passage of One Pulse Rering Signal

ED-91738-01 — Composite Signaling Type "B" — CX Signaling Unit and Associated Network Equipment — Phantom Group or Single Circuits for 2-way Signaling and Dialing for Use With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits Without Intermediate Telephone Repeaters or Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater

ED-95067-01 — Composite Signaling Type "B" — Phantom Group Unit — For 2-way Signaling and 2-way Dialing Over Short-haul Cable and Open-wire Circuits With One Intermediate Telephone Repeater

## 4. EQUIPMENT

***J98606B — AT&TCo Std — Type "B" 2-way Composite Signaling and Dialing Unit Equipment for Combination Open-wire and Cable Circuits With One Intermediate Voice Repeater — 48-volt Offices — Arranged for Earth Potential Compensation — Maximum Loop Resistance 4400 Ohms of Cable***

Equipment — ED-95067-01, Fig. 1

*List 1* — Framework, assembly, universal wiring, and common equipment for one phantom group (three circuits)

| | WIRE | EQUIP | NOTES |
|---|---|---|---|
| Framework, ED-90782-01, G6 | | 1 | |
| Type "B" CX Sig Ckt, SD-95067-01, Figs. 1, 2, & 3 with all options | 1 | 0 | |

*List 2* — Equipment per SD-95067-01, Fig. 1 (less (B) resistance) or Fig. 3 required in addition to list 1 for one side circuit (S1) or (S2) arranged for 2-way signaling and dialing between 48-volt offices (see notes A and B)

*List 3* — Equipment per SD-95067-01, Fig. 2 required in addition to lists 1 and 2 for one phantom circuit

*Notes*

A. All apparatus shall be furnished and strapped as required to meet job requirements.

B. The (B) 18AJ resistance shall be specified in addition to list 2 for circuit (S1).

***J98606E — AT&TCo Std — Type "B" Composite Signaling Unit and Associated Network Equipment for 2-way Signaling Only Over Cable Circuits With or Without an Intermediate Repeater — Arranged for Phantom or Nonphantom Group Operation and Earth Potential Variation***

*List 1* — A&M Only — Framework, assembly, and common equipment for one phantom group (three circuits) with wiring and equipment for side circuit (S1) or circuit (1) — surface-wired

| | WIRE | EQUIP | NOTES |
|---|---|---|---|
| Framework, ED-90782-01, G2 | | 1 | |
| Type "B" CX Sig Ckt, SD-95084-01, Fig. 1 (S1) or (1) | 1 | 1 | A |

*List 2* — A&M Only — Wiring and equipment per SD-95084-01, Fig. 3 required in addition to list 1 for one side circuit (S2) or (2) circuit (see note A)

*List 3* — A&M Only — Wiring and equipment per SD-95084-01, Fig. 2 required in addition to lists 1 and 2 for one phantom circuit (PH) (see note A)

*List 7* — Assembly, wiring, and common equipment per SD-95084-01, Fig. C required in addition to list 1 or 11 for (S1) or circuit (1) or in addition to list 3 or 13 for phantom circuit for the network for use with a line not equipped with an intermediate repeater — surface-wired (Equipment — ED-91680-01, Fig. 4)

*List 8* — Wiring and equipment per SD-95084-01, Fig. C required in addition to list 7 and list 2 or 12 for (S2) or circuit (2) for the network for use with a line not equipped with an intermediate repeater — surface-wired (Equipment — ED-91680-01, Fig. 4)

*List 9* — Assembly, wiring, and equipment per SD-95084-01, Fig. D required in addition to list 1 or 11 for (S1) or circuit (1) or in addition to list 3 or 13 for phantom circuit for the network for use with a line equipped with an intermediate repeater — surface-wired (Equipment — ED-91680-01, Fig. 5)

*List 10* — Assembly, wiring, and equipment per SD-95084-01, Fig. D required in addition to list 2 or 12 for the network for (S2) or circuit (2) for the network for use with a line equipped with an in-

termediate repeater — surface-wired (Equipment — ED-91680-01, Fig. 5)

*List 11* — Framework, assembly, and common equipment per SD-95084-01, Fig. 4 for one phantom group and one side circuit (S1) or circuit (1) — surface-wired (see note B) (Equipment — ED-91680-01, Fig. 7)

*List 12* — Wiring and equipment per SD-95084-01, Fig. 6 required in addition to list 11 for one side circuit (S2) or circuit (2) — surface-wired (see note B) (Equipment — ED-91680-01, Fig. 7)

*List 13* — Wiring and equipment per SD-95084-01, Fig. 5 required in addition to lists 11 and 12 for one phantom circuit — surface-wired (see note B) (Equipment — ED-91680-01, Fig. 7)

*List 14* — Mounting bars for three phantom groups or ten nonphantom groups and equipment for one circuit (S1) or (1) per SD-95084-01, Fig. 4, 5, or 6 required when the associated trunk is a 4-wire trunk (Equipment — ED-91680-01, Fig. 6)

*List 15* — Equipment per SD-95084-01, Fig. 4, 5, or 6 required in addition to list 14 for one additional circuit when the associated trunk is a 4-wire trunk (Equipment — ED-91680-01, Fig. 6)

*Notes*

A. J, R, S, T, V, and W wiring covered in Figs. 1, 2, and 3 per SD-95084-01 shall be provided at the unit terminal strip by the installer. All optional apparatus covered in Figs. 1, 2, and 3 shall be furnished and wired as indicated above to meet job requirements.

B. J, R, S, T, V, W, ZI, and ZJ wiring covered in Figs. 4, 5, and 6 per SD-95084-01 shall be provided at the unit terminal strip by the installer.

***J98606G — AT&TCo Std — Type "B" Composite Signaling Unit Equipment — For 2-way Signaling and Dialing With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits Without Intermediate Telephone Repeaters or for Use With Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater — Arranged for Phantom Group Operation and Earth Potential Variation***

Equipment — ED-91738-01, Fig. 1

*List 1* — Framework, assembly, and common equipment for one phantom group (three circuits) with wiring and equipment for one circuit (S1) or (1) — surface-wired

| | WIRE | EQUIP | NOTES |
|---|---|---|---|
| Framework, ED-90782-01, G2 | | 1 | |
| Type "B" CX Sig Ckt, SD-95048-01, Fig. 1 (S1) | 1 | 1 | A |

*List 2* — Wiring and equipment per SD-95048-01, Fig. 3 required in addition to list 1 for one circuit (S2) or (2)

*List 3* — Wiring and equipment per SD-95048-01, Fig. 2 required in addition to list 1 for the phantom circuit (PH)

*Note*

A. All optional apparatus covered in Figs. 1, 2, and 3 of SD-95048-01 shall be furnished and so wired that the options may be connected at the terminal strips.

***J98606H — AT&TCo Std — Type "B" CX Signaling Network Equipment for Use With the J98606G Signaling Unit — For Use With Type "C" Composite Sets Over Short-haul Cable and Open-wire Circuits Without Intermediate Telephone Repeaters or for Use With Type "E" Composite Sets Over Cable Circuits With or Without One Intermediate Telephone Repeater***

Equipment — ED-91738-01, Figs. 3 & 4

*List 1* — Assembly, wiring, and equipment for one network per SD-95048-01, Fig. C and ED-91738-01, Fig. 3 for a signaling circuit used on a cable circuit equipped with type "E" composite set but without intermediate telephone repeater —surface-wired (see note A)

*List 3* — Assembly, wiring, and equipment for one network per SD-95048-01, Fig. B and

ED-91738-01, Fig. 3 for a signaling circuit used on an open wire or cable circuit equipped with type "C" composite set but without intermediate telephone repeater — surface-wired (see note A)

*List 4* — Assembly, wiring, and equipment for one network per SD-95048-01, Fig. D and ED-91738-01, Fig. 4 for a signaling circuit used on a cable circuit equipped with type "E" composite set and with one intermediate V1 telephone repeater — surface-wired (see note A)

*List 5* — Assembly, wiring, and equipment per SD-95048-01, Fig. 4 required in addition to list 1, 3, or 4 when the composite signaling circuit is remote from the composite set — surface-wired

*Note*

A. All optional wiring covered on SD-95048-01, Figs. B, C, and D shall be furnished.

***J98606J — AT&TCo Std — Type "B" Composite Signaling Unit Equipment — For 2-way Signaling and Dialing Over Cable Circuits With One Intermediate Repeater — Maximum 12,000-ohm Loop Resistance — Arranged for Phantom or Nonphantom Group Operation and Earth Potential Variation***

Equipment — ED-55415-01

*List 1* — Framework, assembly, wiring, and common equipment for one phantom group signaling unit (three circuits) with wiring and equipment for one circuit (S1) or (1) — maximum loop resistance 8000 ohms — surface-wired

| | WIRE | EQUIP | NOTES |
|---|---|---|---|
| Framework, ED-90782-01, G4 | | 1 | |
| Type "B" CX Sig Ckt, SD-55415-01, Fig. 1 (S1) or (1) | 1 | 1 | A |

*List 2* — Wiring and equipment per SD-55415-01, Fig. 3 required in addition to list 1 for one circuit (S2) or (2) (see note A)

*List 3* — Wiring and equipment per SD-55415-01, Fig. 2 required in addition to lists 1 and 2 for the phantom circuit (PH) — maximum loop resistance 8000 ohms (see note A)

*List 4* — Equipment per SD-55415-01, Figs. 5 & 6 required in addition to list 1 when the conductor loop resistance is above 8000 ohms — maximum 12,000 ohms

*List 5* — Equipment per SD-55415-01, Figs. 5 & 6 required in addition to list 2 for nonphantom circuit when the conductor loop resistance is above 8000 ohms — maximum 12,000 ohms

*List 6* — Equipment per SD-55415-01, Fig. 6 required in addition to list 2 or 3 for the phantom circuit (PH) when the conductor loop resistance is above 8000 ohms — maximum 12,000 ohms

*Note*

A. All optional wiring and apparatus covered in Figs. 1, 2, and 3 on SD-55415-01 shall be provided in the unit and connected as required at the terminal strip.

***J98606K — AT&TCo Std — Type "B" CX Signaling Network Equipment for Use With the J98606J Signaling Equipment — For Use With Cable Circuits Having One Intermediate Repeater — Maximum 12,000-ohm Loop Resistance — Arranged for Phantom or Nonphantom Group Operation***

Equipment — ED-55415-01

*List 1* — Framework, assembly, wiring, and common equipment for one phantom group network unit (three circuits) with wiring and equipment for one circuit (S1) or (1) — surface-wired

| | WIRE | EQUIP | NOTES |
|---|---|---|---|
| Framework, ED-90782-01, G4 | | 1 | |
| Type "B" CX Sig Ckt, SD-55415-01, Fig. 4 (S1) or (1) | 1 | 1 | A |

*List 2* — Wiring and equipment per SD-55415-01, Fig. 4 required in addition to list 1 for the network for one circuit either side or phantom (S2) or (2) or (PH) (see note A)

*List 3* — Wiring and equipment per SD-55415-01, Fig. 7 required in addition to list 2 for the network for one circuit either side (S2) or (2) or phantom (PH) when the composite equipment and composite signaling equipment are located at points remote from each other.

*Note*

A. All optional wiring and apparatus covered in Fig. 4 on SD-55415-01 shall be provided in the unit and connected as required in the field.

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## 5. GENERAL NOTES

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

| EQUIPMENT | RATING | COVERED IN ISSUE | EQUIPMENT REPLACING |
|---|---|---|---|
| J98606A | Mfr Disc. | 9 | J98604E,L1 J98604F,L1 |
| J98606C | Mfr Disc. | 9 | J98604C,L1 J98604D,L1 |
| J98606D | Mfr Disc. | 5 | J98606F |
| J98606E,L1, L2, & L3 | A&M Only | 8 | J98606E,L11, L12, & L13 |
| J98606E,L4, L5, & L6 | Mfr Disc. | 5 | J98606E,L7 & L8, L9, or L10 |
| J98606F | Mfr Disc. | 6 | J98606J & K |
| J98606H,L2 | Mfr Disc. | 7 | — |

The above equipment has been replaced as indicated.