DATA AUXILIARY SET 811D1

IDENTIFICATION AND OPERATION

1. GENERAL

1.01 This section contains descriptive and operational information for Data Auxiliary Set 811D1. It does not include information regarding the customer's equipment associated with the data auxiliary set.

1.02 The Data Auxiliary Set 811D1 provides an interface between a Data Set 205C2 and customer-furnished data equipment such as a Crypto Ancillary Unit (CAU). The data auxiliary set is designed to provide compatibility between Data Set 205C2 and Data Set 207-type. This is achieved within the following limitations:

- Operation with the associated Data Set 207-type is restricted to 2400 bps.

- Regeneration feature of Data Set 205C2 cannot be used if the data set is connected through a Data Auxiliary Set 811D1.

- Remote test of Data Auxiliary Set 811D1 is not provided.

1.03 Data Auxiliary Set 811D1 was initially designed to operate in a secure voice network such as Switching System No. 307.

2. DESCRIPTION

2.01 Data Auxiliary Set 811D1 interfaces between the customer equipment and Data Set 205C2 through three interface connectors. The CUSTOMER A1 connector (J64) carries data, clock, and delayed Carrier ON-OFF (COOD) interface circuits. The CUSTOMER B1 connector (J63) carries all control, data, and clock interface circuits. The DATA SET 205 connector (P65) carries all control, data, and clock interface circuits to the Data Set 205C2. Terminal assignments for all connectors are as defined by EIA Interface Specification RS-232-A when applicable.

2.02 All interface circuits on connectors CUSTOMER A1 and CUSTOMER B1, except seven, meet the EIA electrical specification. Circuits for Send Data (SD), Receive Data (RD), Serial Clock Transmit (SCT), Dibit Clock Transmit (DTIA), and Serial Clock Receive (SCR) meet the intent of Military Standard 188B. These five circuits are designed to generate (or accept, as in the case for Send Data) waveforms with longer rise and fall times than permitted using EIA specifications. This has reduced crosstalk by a significant amount. The Carrier ON-OFF Delayed (COOD) circuit is designed to meet the intent of MIL-M-55408 (EL) to provide a unipolar zero to +6.0 volt output.

A. Physical Description

2.03 The Data Auxiliary Set 811D1 is a 23-inch wide rack-mounted set requiring six inches of vertical space and is approximately 9.5 inches deep. The front view of Data Auxiliary Set 811D1 is shown in Fig. 1.

2.04 The data auxiliary set contains nine circuit packs consisting of five different types together with a 26A Power Unit. The circuit pack numbers and reference location numbers on the data auxiliary set are shown in Table A. The equipment location numbers and the AR designations of the circuit packs are stamped on the bottom and top, respectively, of the apparatus mounting. A rear view of the data auxiliary set showing the circuit pack reference location numbers is shown in Fig. 2.

2.05 The Data Auxiliary Set 811D1 weighs 17.3 pounds.

B. Electrical Description

2.06 The Data Auxiliary Set 811D1 contains the following major circuit categories:

(1) 26A Power Unit

(2) Scrambler

(3) Descrambler

(4) Carrier ON-OFF Delay (COOD)

(5) Interface Connectors

2.07 A block diagram illustrating interconnections between the data auxiliary set functions is shown in Fig. 3. A brief description of each block in numerical sequence is presented in the following paragraphs.
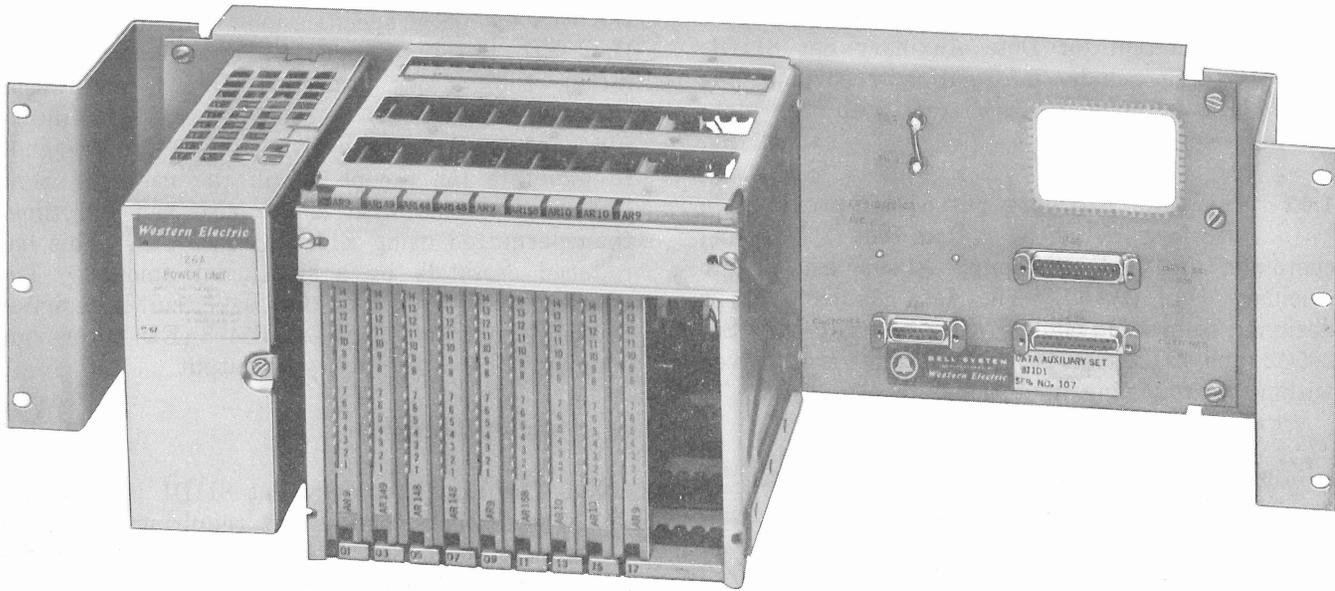

Fig. 1—Data Auxiliary Set 811D1, Front View

TABLE A

CIRCUIT PACK REFERENCE INFORMATION

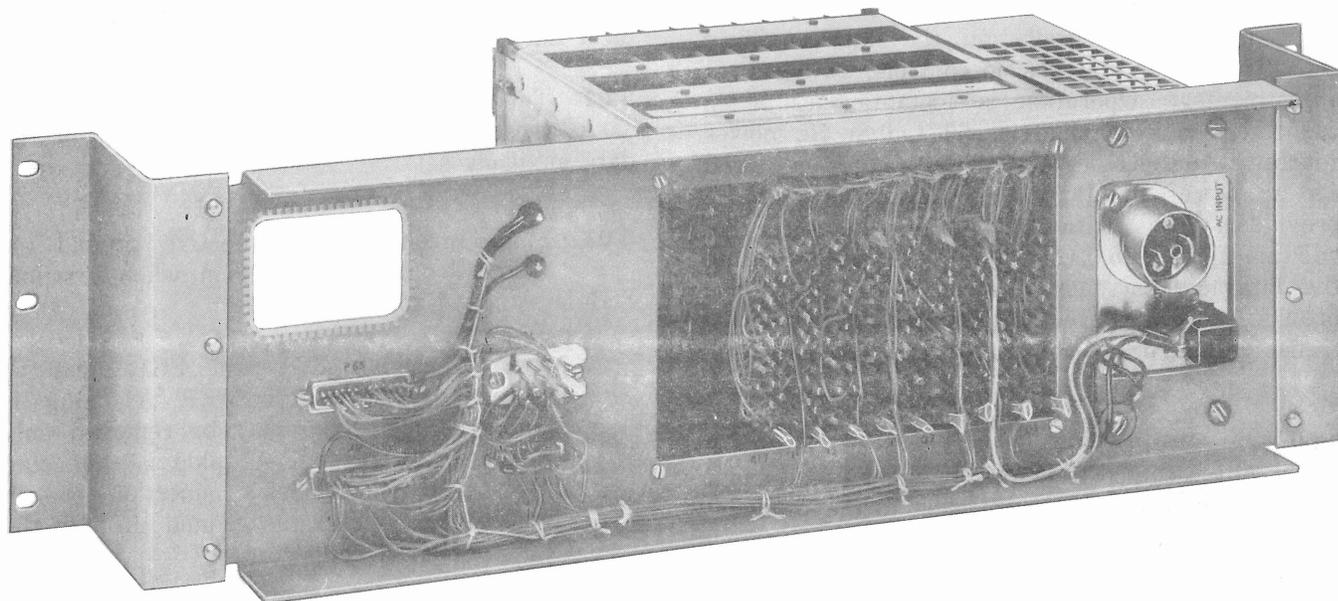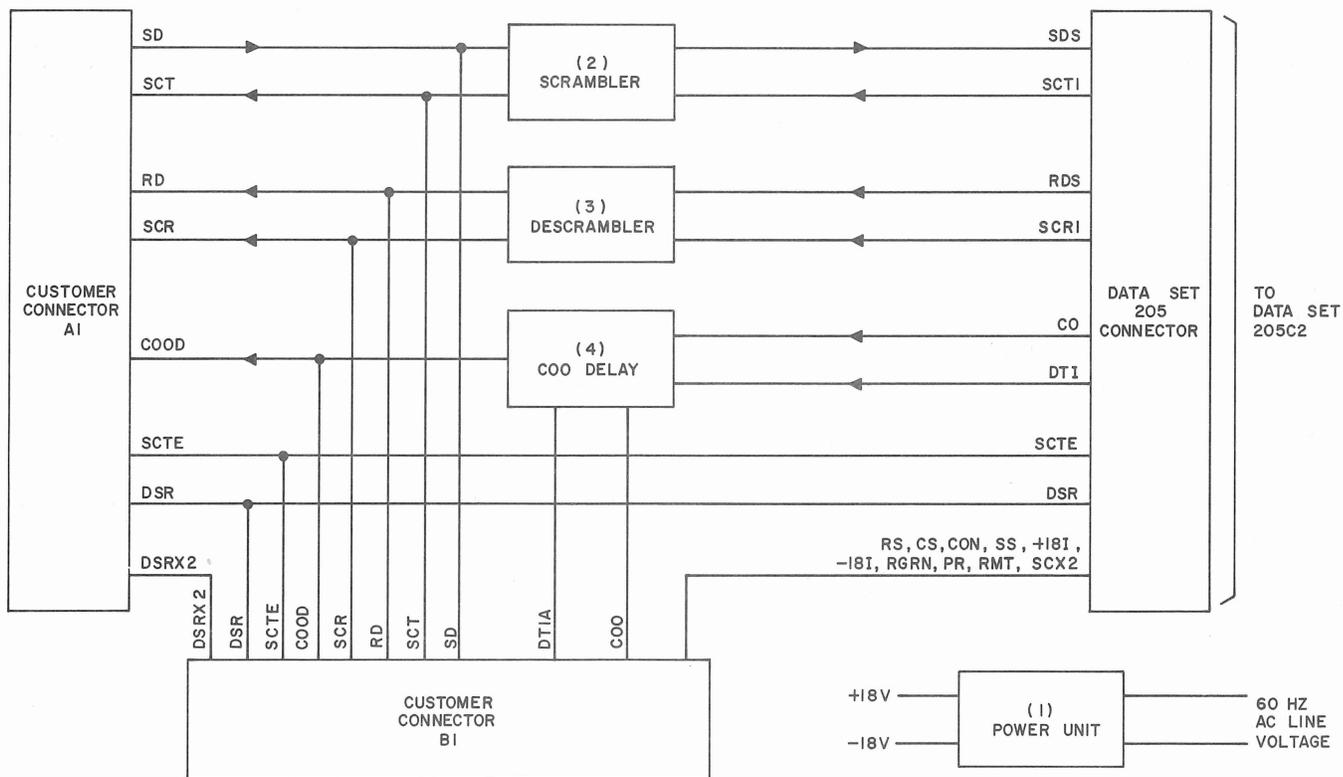| TYPE OF CIRCUIT	NUMBER OF BOARDS	EQUIPMENT LOCATIONS	CIRCUIT PACK NUMBER
NOR Gates	3	01, 09, 17	AR9
Complementary Flip-Flop	2	13, 15	AR10
Mil. Standard Interface	2	05, 07	AR148
Shift Register	1	03	AR149
6V Interface	1	11	AR158

Fig. 2—Data Auxiliary Set 811D1, Rear View

Fig. 3—Data Auxiliary Set 811D1, Block Diagram

2.08 *(1) 26A Power Unit:* The power unit is mounted integrally on the data auxiliary set. The power unit has no controls, switches, or adjustments. Operation is instantaneous when connected to a commercial 60 (±0.8) Hz power source. All necessary connecting cords required for ac power inputs and dc power outputs are provided. Two rectifier outputs provide the +18.0 vdc (pin 2) and –18.0 vdc (pin 3) required to operate the data auxiliary set. The remaining connections provide a common (rectifier) ground (pin 4) and a frame ground or ac power third wire ground (pin 1).

2.09 *(2) Scrambler:* The serial Send Data (SD) bits received from the customer's equipment are scrambled before transmission to the Data Set 205C2 as SDS. The scrambler transforms Send Data in a logical manner so that the far-end receiver can recover timing information on repeated "1's" (a positive voltage) or steady reversals (alternate "1's" and "0's") on SD. Only steady "0's" provide no receiver timing information.

2.10 *(3) Descrambler:* The scrambled serial data bits (Receive Data Scrambled or RDS) received from the Data Set 205C2 are descrambled before transmission to the customer's equipment on interface lead RD.

2.11 *(4) Carrier ON-OFF Delay (COOD):* A change from an ON to an OFF condition on the Carrier ON-OFF (COO) lead from the Data Set 205C2 is delayed 2.026 seconds (+0.0 msec, –0.833 msec) before transmission to the customer's equipment on interface lead COOD. A change from an OFF to an ON condition is delayed 1.013 second (+0.0 msec, –0.833 msec) before transmission to the customer's equipment.

2.12 *(5) Interface Connectors:* These circuits consist of CUSTOMER A1 jack (J64), CUSTOMER B1 jack (J63), and DATA SET 205 connector plug (P65). The Data Auxiliary Set 811D1 is interconnected with customer equipment through CUSTOMER A1 and CUSTOMER B1 jacks. The data auxiliary set is interconnected with Data Set 205C2 through the DATA SET 205 connector.

3. OPERATION

3.01 Operation of the Data Auxiliary Set 811D1 through a Data Set 205C2 connected to a four-wire facility can transmit and receive simultaneously. Calls between stations are made on a full-duplex basis.

3.02 The required operating voltages are provided by the 26A Power Unit contained in the data auxiliary set.

3.03 Signal ground and protective ground (or frame ground) are common when terminal SG1 is strapped to terminal FG1.

Note: Terminals SG1 and FG1 must be strapped if the CUSTOMER A1 plug is removed. The strap may be removed only when the CUSTOMER A1 plug is connected and the customer supplies a connection between signal ground and frame ground through the CUSTOMER A1 connector.

3.04 The Transmit-Receive Switch printed wiring board in the Data Set 205C2 (AR95 in slot location 019) must be conditioned for continuous carrier operation by strapping terminal 1 to terminal 2. The data set functions Request to Send (RS) and Clear to Send (CS) are not used, and the Confirm (CON) function is wired permanently to a –6.0 vdc source (OFF condition). Similarly, the Regenerator (RGRN) function is also wired to a –6.0 vdc source (OFF condition) since the Data Set 205C2 cannot be used as a regenerative repeater when connected to the data auxiliary set.

3.05 The Speed Select (SS) function is permanently connected to a +6.0 vdc source through the data auxiliary set to lock the Data Set 205C2 bit rate speed to 2400 bps for compatibility with Data Set 207-type stations. The 2400 bps rate is the only compatible speed for interchange between 205C2 and 207-type stations.

3.06 The CUSTOMER A1 connector of the Data Auxiliary Set 811D1 performs the same functions as the CUSTOMER A connector on the Data Set 205C2 with the following exceptions and additions:

(a) Clock rate selection (SCX2) and ground leads are not provided.

(b) The external timing (SCTE) lead and Carrier ON-OFF Delayed (COOD) lead are provided at the CUSTOMER A1 connector.

3.07 The CUSTOMER B1 connector of the Data Auxiliary Set 811D1 performs the same function as the CUSTOMER B connector on the Data Set 205C2.

3.08 Operational limits of the Data Auxiliary Set 811D1 are for an ambient temperature range of +50 to +120° F with a relative humidity of between 20 and 95 percent.

3.09 Detailed operation of the Data Auxiliary Set 811D1 circuits is contained in CD- and SD-1D146-01.