DATA AUXILIARY SETS 801A1, 801A2, 801A3, AND 801A4 FOR AUTOMATIC CALLING DESCRIPTION AND OPERATION

1. GENERAL

1.01 This section is reissued to revise the text. Due to extensive revisions change arrows have been omitted.

1.02 The Data auxiliary sets 801A1, 801A2, 801A3, and 801A4 will be referred to in this section as ACU's (automatic calling units), and are shown by Fig. 1.

1.03 These Data Auxiliary Sets provide a means for a business machine to automatically originate DATA-PHONE* calls on facilities equipped with DIAL pulse signaling. These ACU's have

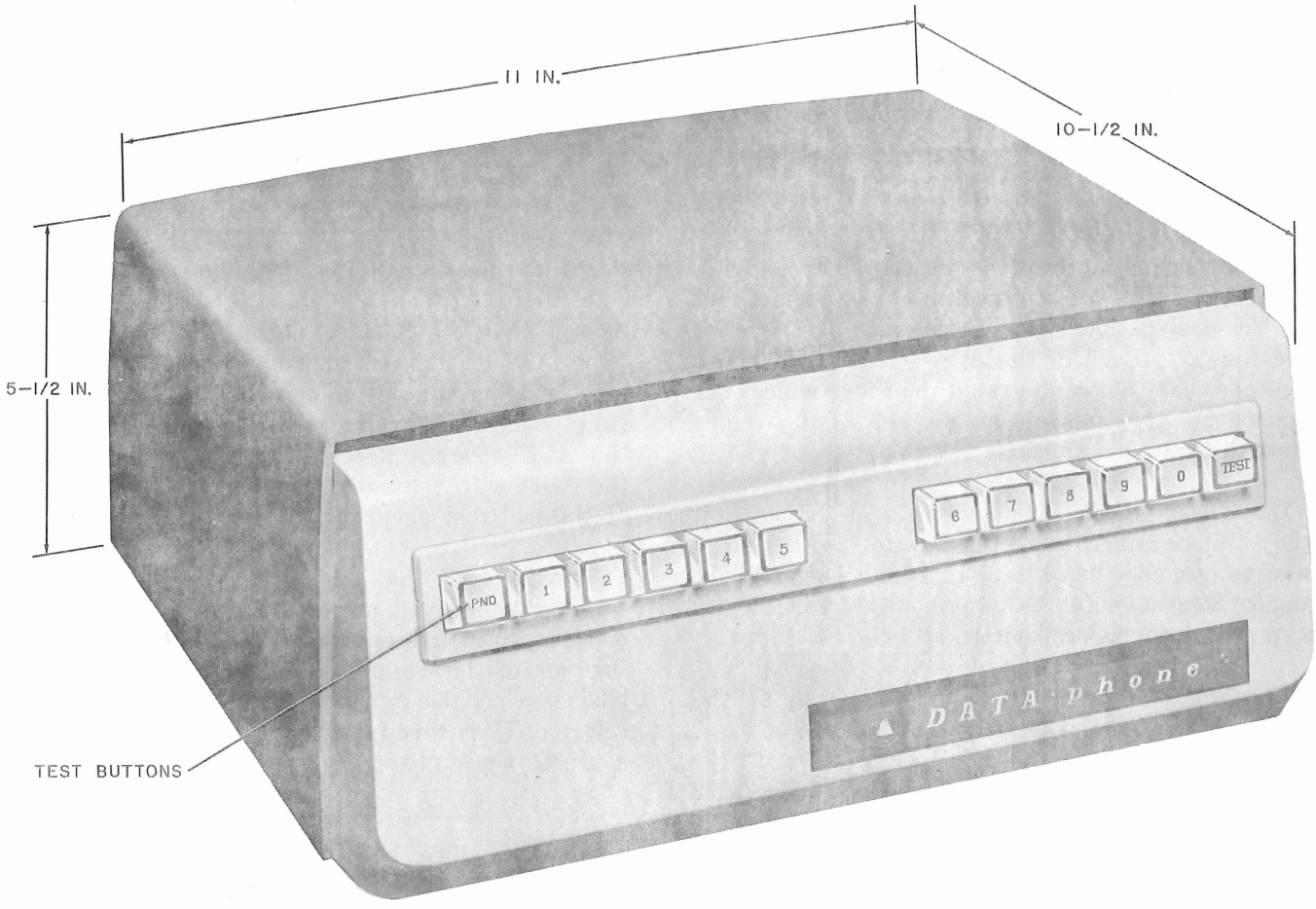

Fig. 1—Data Auxiliary Set 801A-Type, Front View

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the capability for calling any number using information provided by the business machine.

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1.04 The ACU's are compatible with business machines that conform to the ASCII (American Standard code for Information Interchange) code. These ACU's are compatible with any data set that uses a 58-type line control circuit or 3A type Data Units.

1.05 The ACU's are essentially the same except for the following differences:

(1) The 801A1 and 801A4 conform to the EIA Standard RS-232A for voltage whereas the 801A2 and 801A3 use contact interface.

(2) The 801A1 and 801A2 are equipped for answer-tone detection but the 801A3 and 801A4 are not.

1.06 The operation of the business machine and/or the data set will not be described in this section.

2. DESCRIPTION

2.01 Externally, the ACU's, 801A1, 801A2, 801A3, and 801A4 are identical in appearance except for the designation strip on the rear of the ACU (see Fig. 2). Each of the ACU's is contained in a two-tone gray, nonintegrated housing which has dimensions as shown in Fig. 1 and weighs approximately 16 pounds.

2.02 These ACU's will operate over an ambient temperature range of 40 to 120°F and a relative humidity of 20 to 95 percent. These ACU's require approximately 10 watts of 117-volt, 60 Hz ac power from a local outlet.

2.03 The two cords supplied with each of the Data Auxiliary Sets are as follows:

(1) A D10P-61 mounting cord which is 5-1/2 feet long and consists of 10 conductors, is provided.

Note: Early models of the Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 were equipped with a D10H-61 mounting cord which has been classified as Manufacture Discontinued. When a mounting cord of more than 10 conductors is required, an M14C-61 mounting cord which is 5-1/2 feet long and contains 14 conductors, is available. The cord replacement procedure is described in the section entitled Data Auxiliary Sets 801A, 801A2, 801A3, and 801A4 For Automatic Calling, Maintenance (598-010-300).

(2) A KS-14532 L16 gray power cord which is 10 feet long and contains 3 conductors is provided.

2.04 The cord required for the connection of the business machine to the ACU interface is supplied by the customer. The cord must not exceed 50 feet in length and must be equipped with a plug that mates with a KS-19087 L6 connector which is located in the rear of Data Auxiliary Set (Fig. 2).

2.05 The ACU's provide a means of testing that is independent of the business machine control signals. The test buttons shown in Fig. 1 are used to simulate the control signals that are normally furnished by the business machine. For information on the testing of the Data Auxiliary Sets by using the test buttons refer to the section entitled Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 For Automatic Calling Test Procedures (598-010-500).

2.06 When the Data Auxiliary Sets are placed in the test mode all call progress tones (Dial tone, ringing, etc.) can be monitored on the call test speaker. The call test speaker is located under the ACU cover. Refer to Fig. 3 for a view of the ACU with the cover removed and the location of the call test speaker.

2.07 Each of the Data Auxiliary Sets has an abandon call and retry time circuit that is referred to in this section as an ACR circuit. The function of this circuit is to supply a signal to the business machine when dial tone, interdigital, or call completion time (answer signal received) exceeds a preset time interval.

Note: The ACR timer can be adjusted to give 7-, 10-, 15-, 25-, or 40- second time interval with a tolerance of +20, -0 percent. For information on making this adjustment refer to the section entitled Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 For

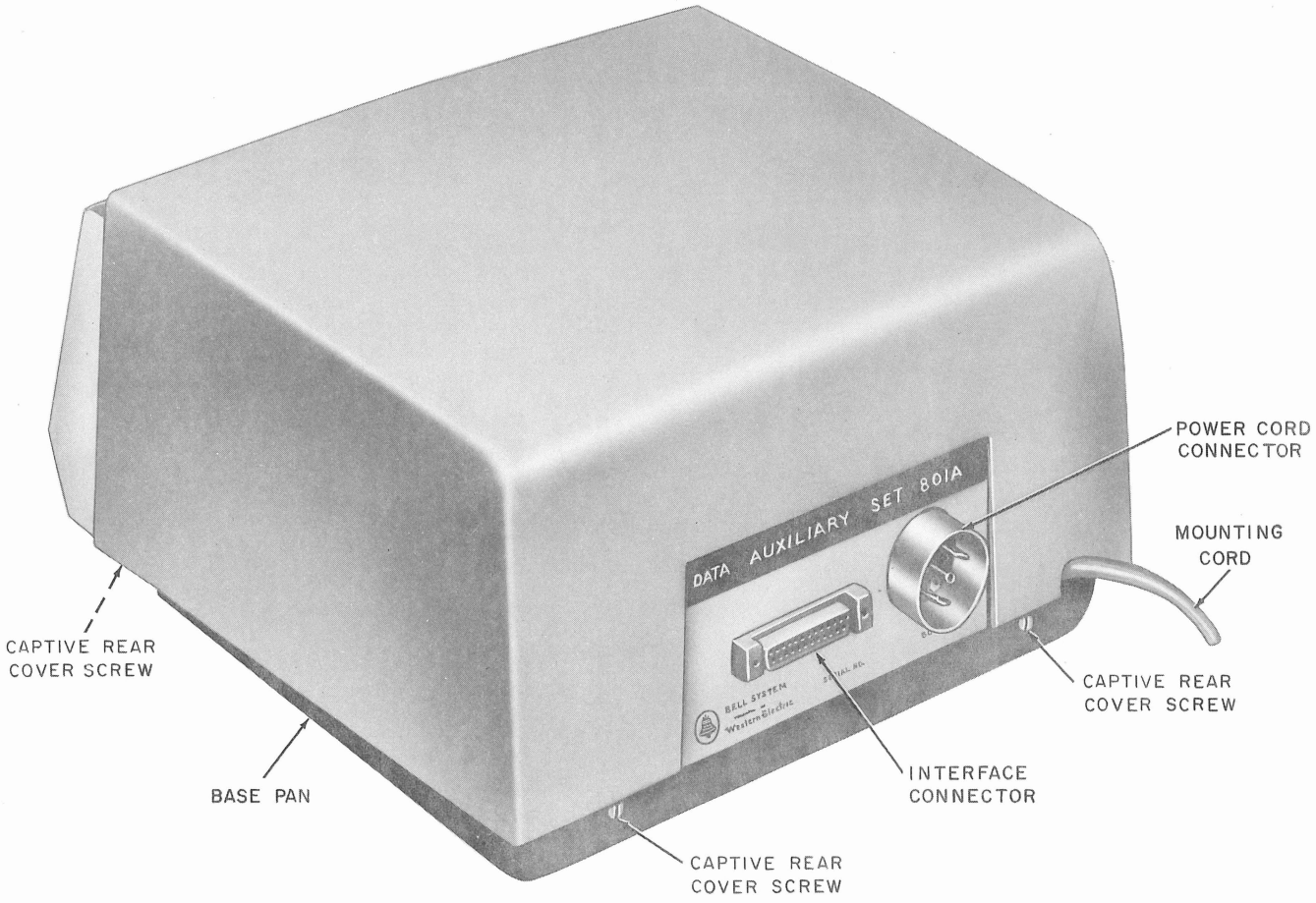

Fig. 2—Data Auxiliary Set 801A-Type, Rear View

Automatic Calling Installation and connection (598-010-200).

2.08 The ACU's utilize common components such as ACR timer, intercall timer, interface circuits, call origination and termination control, and circuits for the generation of dial pulses. These sets differ as follows:

(1) Data Auxiliary Set 801A1 furnishes voltage interface and answer-tone detection.

(2) Data Auxiliary Set 801A2 furnishes contact interface and answer-tone detection.

(3) Data Auxiliary Set 801A3 furnishes contact interface without answer-tone detection.

(4) Data Auxiliary Set 801A4 furnishes voltage interface without answer-tone detection.

Note: For information about the options available on the Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 refer to the section entitled Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 For Automatic Calling Installation and Connection (598-010-200).

3. OPERATION

3.01 ***Automatic Origination:*** The business machine starts the call origination process by turning CRQ (Call Request) on. If DLO (Data Line Occupied) is off (communication channel is not in use), the ACU will seize the telephone line and appear off-hook to the central office by grounding the Ring lead.

A ground start telephone line must be provided.

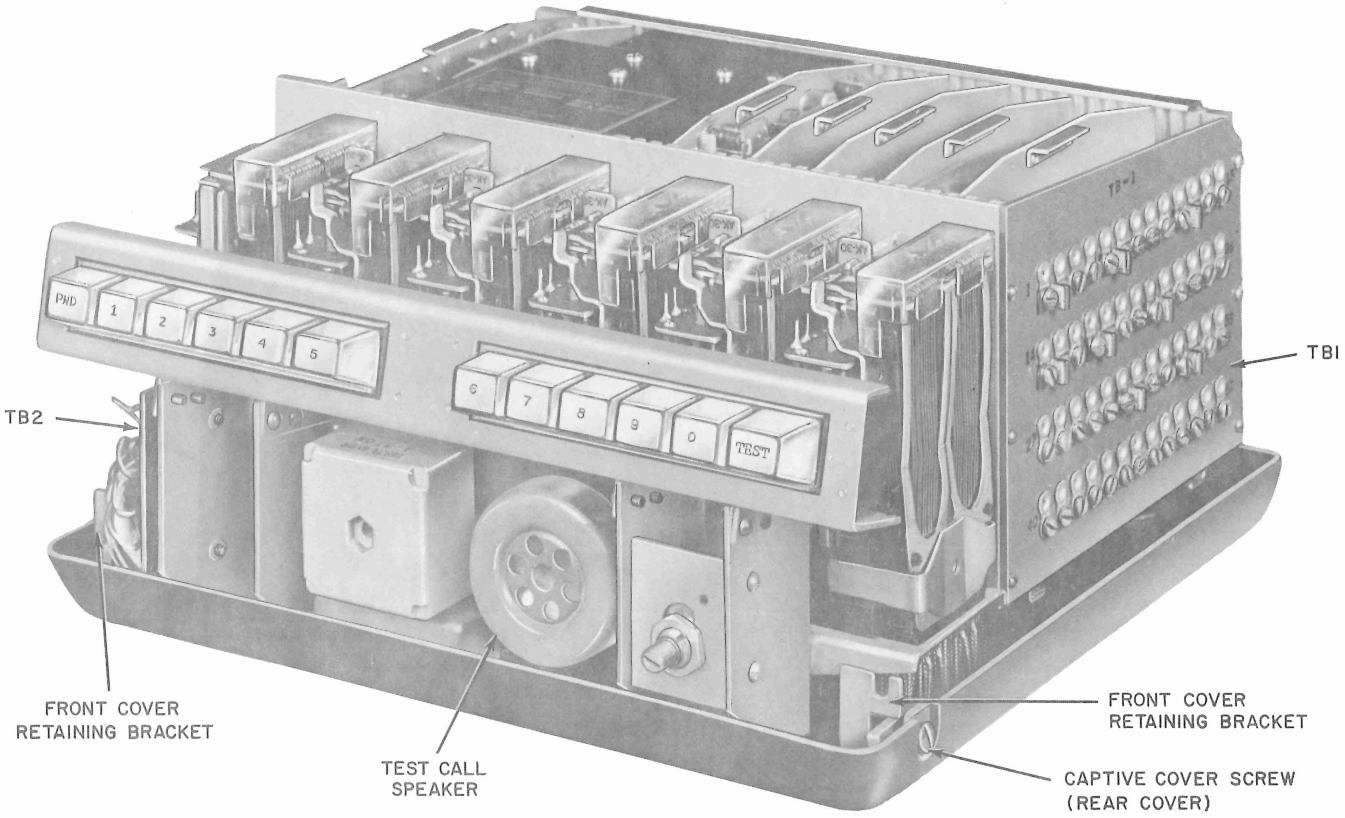

Fig. 3—Data Auxiliary Set 801A-Type, Front Inside View

The central office will respond by grounding the Tip side of the line when it is prepared to accept dial information. The ACU detects this ground, completes a loop from Tip to Ring, removes the ground from the Ring lead and turns on both DLO (Data Line Occupied) and PND (Present Next Digit).

If the central office does not ground the Tip side within the time allocated by the ACR Timer, the ACR (Abandon Call and Retry) will turn on. This indicates to the business machine that the call should be abandoned and reestablished.

In response to PND on, the business machine sets the four number leads (NB1, NB2, NB4, or NB8) for the digit it wants dialed and then turns DPR (Digit Present) on. The dial pulse generator sends that digit to the central office and then turns PND off. The business machine turns off DPR in response to PND off and waits for the next digit request from the ACU. When PND goes back on and the number leads have been set to the next digit, the business machine turns DPR on and the ACU dials that digit. This process is continued until the last digit is dialed.

Any delay by the business machine in turning DPR off or on may increase the time used to dial the telephone number. If this time exceeds the ACR timer interval, the ACR will turn on.

After the last digit has been transmitted, the answer-tone (2025 Hz or 2225 Hz) can be detected after which the line is transferred to the associated data set.

3.02 Methods of Transferring the Line to the Data Set

(a) ***Data Set Answer Dtection With End-of-Number:*** This form of detection is the

only detection feature available for Data Auxiliary Sets 801A3 and 801A4 but can be provided in the Data Auxiliary Sets 801A1 and 801A2 by the removal of R option. The business machine presents a EON (End-of-Number) code combination on the number leads of the ACU and turns on the DPR (Digit Present). The EON code causes the ACU to transfer the telephone line to the data set and puts the data set off-hook. The off-hook data set causes DSS (Data Set Status) to turn on. The data set can then detect answer-tone and must do any "handshaking" necessary in the preparation for transmission.

(b) ***ACU Answer Detection:*** The answer-tone detection circuitry is provided in Data Auxiliary Sets 801A1 and 801A2 only with the installation of R option. After the ACU has seized a telephone line, the dial-go-ahead has been detected, and a digit is not being dialed, the answer detector is prepared to detect an answer-tone from the called station. When the called station answers by sending back the proper answer-tone, the ACU answer detector recognizes the tone and transfers the telephone line to the data set which places the data set in the data mode. The DSS (Data Set Status lead will be turned on and data transmission can take place.

3.03 ***Call Termination When Calls are Originated Automatically:*** Calls which are originated automatically, may be terminated in either of the following manners:

(a) ***Terminate Call Via The Data Set:*** When the ACU is arranged for Z option, the business machine can drop the CRQ (Call Request) lead at any time after the DSS (Data Set Status) lead comes ON, but must drop the CRQ before attempting to terminate the call. The dropping of the CRQ lead causes the ACR timer to stop. The call is then terminated through the Data Set in the usual manner for the particular data set. When the data set leaves the data mode and goes to the on-hook condition, the DSS lead is turned OFF. The Data Line Occupied (DLO) indication to the business machine is then removed which activates the Intercall Timer and the Present Next Digit (PND) lead is turned OFF. The Intercall Timer remains activated for 1 second. The 1-second interval is to insure that the center telephone office has had sufficient time to recognize the station on-hook condition and break all connections. This causes the ACU to go into an idle state and await the next call.

(b) ***Terminate Call Via ACU:*** If Z option is not used, the business machine starts the call termination by dropping the CRQ lead. This opens the ring side of the central office loop. With the loop opened, the data set now leaves the data mode and goes into the on-hook condition which turns the DSS lead OFF. The Intercall Timer is then activated which turns the DLO lead OFF. The central office loop now partially closes and turns the PND lead OFF. The ACU is now in idle condition and awaiting another call.

3.04 ***Manual Origination:*** A call may be originated manually by using the telephone associated with the data set. Although the attendant need not be aware of it, the ACU is involved in the call origination process in order to ground start the telephone line to get the dial tone. When the associated telephone set is taken off-hook, the ACU automatically seizes the telephone line and grounds the Ring lead. When the central office is ready for dial information, the tip is grounded and dial tone is applied. The ACU detects the grounded tip, removes the ring ground, returns the line to the data set and telephone set and turns on DLO. The ACU will monitor the telephone line and turn DLO off as soon as the line becomes idle.

3.05 ***Test Mode:*** The 12 pushbutton type test buttons on the front panel are used to test the ACU without external test equipment. A call origination may be made using these pushbuttons to accomplish the operation normally done by the business machine. Table A shows the pushbutton lamp assignments and briefly describes their functions. Refer to the section entitled Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 For Automatic Calling Test Procedures (598-010-500) for test operation of the test buttons.

The test mode cannot be used as an alternate mode to transmit data because the ACU automatically times out within 40 seconds, and disconnects the data set (telephone) line.

TABLE A—TEST BUTTON ASSIGNMENTS AND FUNCTIONS

TEST BUTTONS LEFT TO RIGHT FROM FRONT OF SET												
TEST BUTTON DESIGNATION	PND	1	2	3	4	5	6	7	8	9	0	TEST
TYPE OF LAMP FURNISHED	53A	←				53A FURNISHED BUT NOT CONNECTED					→	53A
APPARATUS FEATURE	←					PICKUP NONLOCKING						→
TEST BUTTON FUNCTIONS	USED TO TAKE SET OUT OF TEST MODE LAMP ON INDICATES PRESENT (SEND) NEXT TEST DIGIT (SET MUST BE IN TEST MODE)	USED TO SEND DIGIT 1 TO CO LINE	USED TO SEND DIGIT 2 TO CO LINE	USED TO SEND DIGIT 3 TO CO LINE	USED TO SEND DIGIT 4 TO CO LINE	USED TO SEND DIGIT 5 TO CO LINE	USED TO SEND DIGIT 6 TO CO LINE	USED TO SEND DIGIT 7 TO CO LINE	USED TO SEND DIGIT 8 TO CO LINE	USED TO SEND DIGIT 9 TO CO LINE	USED TO SEND DIGIT 0 TO CO LINE	USED TO PLACE AUX SET IN TEST MODE. ILLUMINATED IN THIS MODE
	←				THESE BUTTONS, WHEN USED, MUST BE HELD DOWN UNTIL PND LAMP GOES OUT. WHEN PND LAMP GOES OUT, RELEASE BUTTON AND WAIT FOR PND LAMP TO COME ON AGAIN BEFORE OPERATING NEXT DIGIT BUTTON.					→	