

**BELL SYSTEM PRACTICES**  
**Teletypewriter and Manual**  
**Telegraph Station and P.B.X.**  
**Installation and Maintenance**

**SECTION P31.241**  
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**AT&T Co Standard**

## **120D1 TELETYPEWRITER**

### **SUBSCRIBER SET**

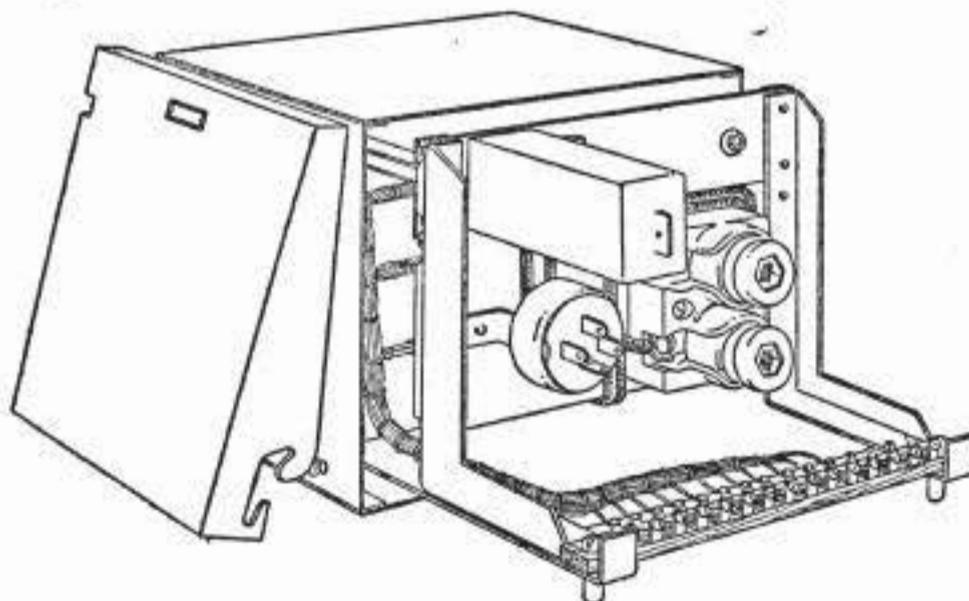
#### **1. GENERAL**

1.01 This section describes the 120D1 teletypewriter subscriber set, which is used for providing unattended service at local teletypewriter stations associated with the No. 1 or 1A TWX switchboard. This set supersedes the No. 120A1 and No. 120B1 teletypewriter subscriber sets.

1.02 The method of starting or stopping the station teletypewriter from the switchboard is the same as that for the 120A1 (or 120B1) sets. To start the machine the current flowing through the tip conductor is reversed to operate a polar relay, which in turn operates power relays. These start the teletypewriter motor and perform other secondary functions described in detail later on. To stop the machine the teletypewriter combinations "Figs.," "Blank," and "H" are transmitted to it in sequence. These open contacts which unlock relays to disconnect power from the motor and restore the station to the idle condition.

#### **2. DESCRIPTION OF EQUIPMENT**

2.01 A picture of the set is shown in Fig. 1.



**Fig. 1—120D1 Teletypewriter Subscriber Set**

2.02 Other equipment not shown in Fig. 1 is required at the station. When used with the 15N table, there is needed a power switch, which is placed in the control panel, and a subscriber set including a ringer and a wave-shaping resistance which is mounted within the table. When used with the 19A table, a 6017 type key is also required for local test purposes. Detailed lists of the equipment required and the installation drawings to be used for a particular station are given in Bell System Practices on "Teletypewriter Station Equipment."

2.03 The 120D1 apparatus is mounted on plates attached to a removable framework unit which stands within a metal cabinet about 7-1/4 inches high by 9 inches wide by 8 inches deep. The box is finished with brown enamel. The framework rests on two runners to allow enough room beneath its base for the placing of connecting wiring. The signal wiring terminals are located on the base near the front. The connecting signal wiring is folded loosely with enough length to permit the framework unit to be removed from the box for maintenance work.

2.04 Power is brought into the set through a rubber-covered cord. One end of this cord connects to the power fittings in the table, and the other to a connector body which plugs into a power fitting in the set. The cord is brought into the box through a notch in the upper left-hand portion of the door.

2.05 The set will be mounted within the 15N and 19A tables as shown in detail on Plan drawings.

### 3. DESCRIPTION OF CIRCUITS

3.01 A description of the circuits of the set will be given for two applications as follows:

- (1) When the set is used with a No. 15 teletypewriter, a-c power supply.
- (2) Same as above except that the No. 19 teletypewriter set is employed.

## No. 15 Teletypewriter Case

3.02 Reference should be made to Fig. 2.

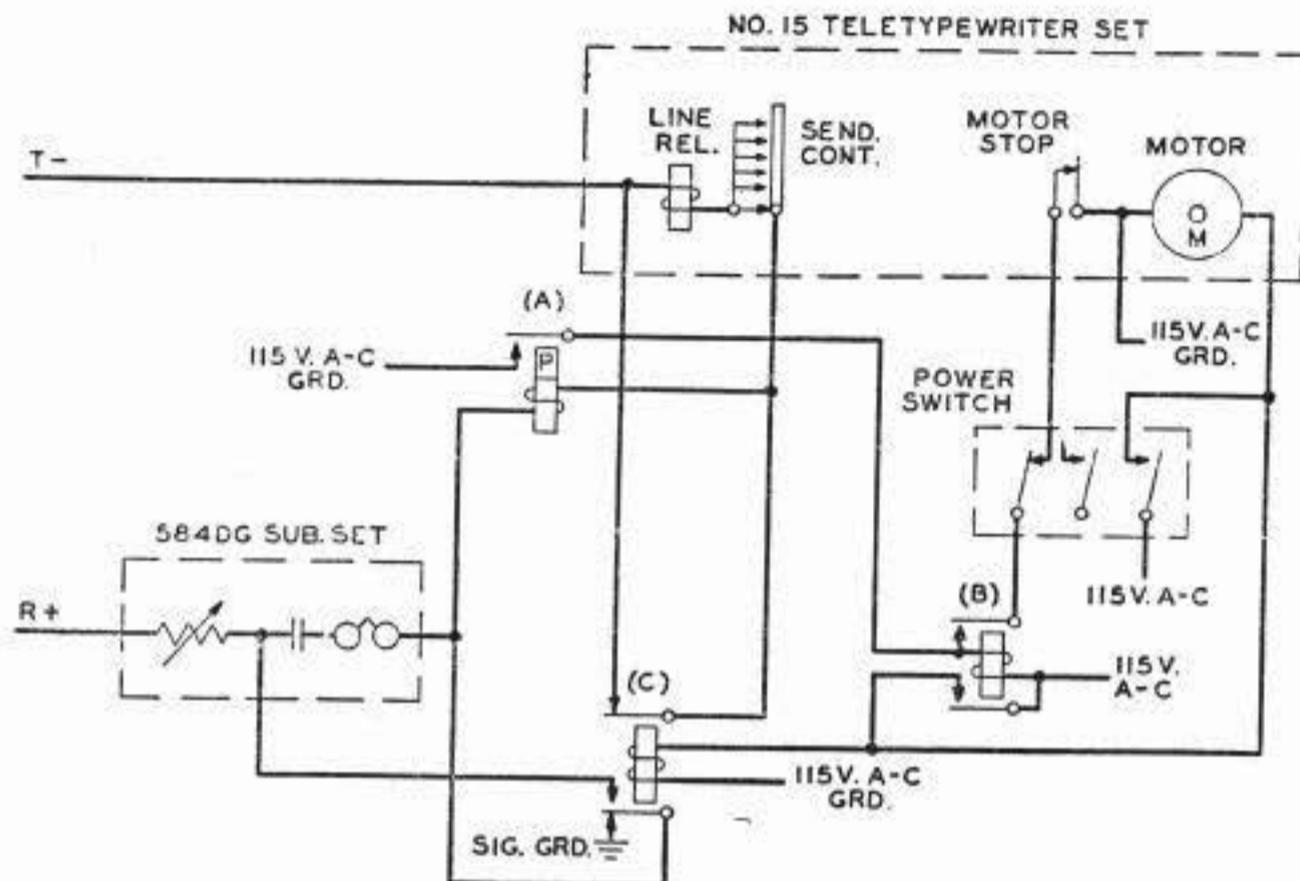


Fig. 2—Schematic of Application to No. 15 Teletypewriter

3.03 It will first be assumed that the teletypewriter is to be started by the switchboard operator. The current through the tip conductor is reversed, and the (A) relay is operated, which operates the (B) relay. The operation of the (B) relay applies power to the motor of the teletypewriter and to the (C) relay. The operation of the (C) relay connects the tip and ring conductors together through the line relay winding and the sending contacts of the teletypewriter, and at the same time removes the ground from the ringing circuit and opens the short circuit path from the sending contacts. The teletypewriter is now in a condition to receive a message.

3.04 At the termination of the communication the teletypewriter is stopped by transmitting to the station a motor stop signal combination ("Figs.," "Blank," and "H"). This momentarily opens the motor stop contacts, which release the (B) relay and then the (C) relay, thus restoring the station to its idle condition.

3.05 When the station is to be used on an attended basis, the attendant operates the power switch to the ON

position. This starts the teletypewriter motor and operates the (C) relay, which, as explained previously, connects the tip and ring conductors together, thereby signaling the TWX switchboard operator. At the termination of the call, the power switch is operated to the OFF position and the (C) relay releases, thus restoring the set to the normal open circuit condition and causing a disconnect to appear at the switchboard.

3.06 The teletypewriter may be stopped locally after it has been started remotely by operating the power switch to the ON position and then to the OFF position. The first operation opens up the locking winding of the (B) relay, releasing it, and the second operation disconnects the power.

### No. 19 Teletypewriter Case

3.07 The station circuit for this case is shown schematically in Fig. 3.

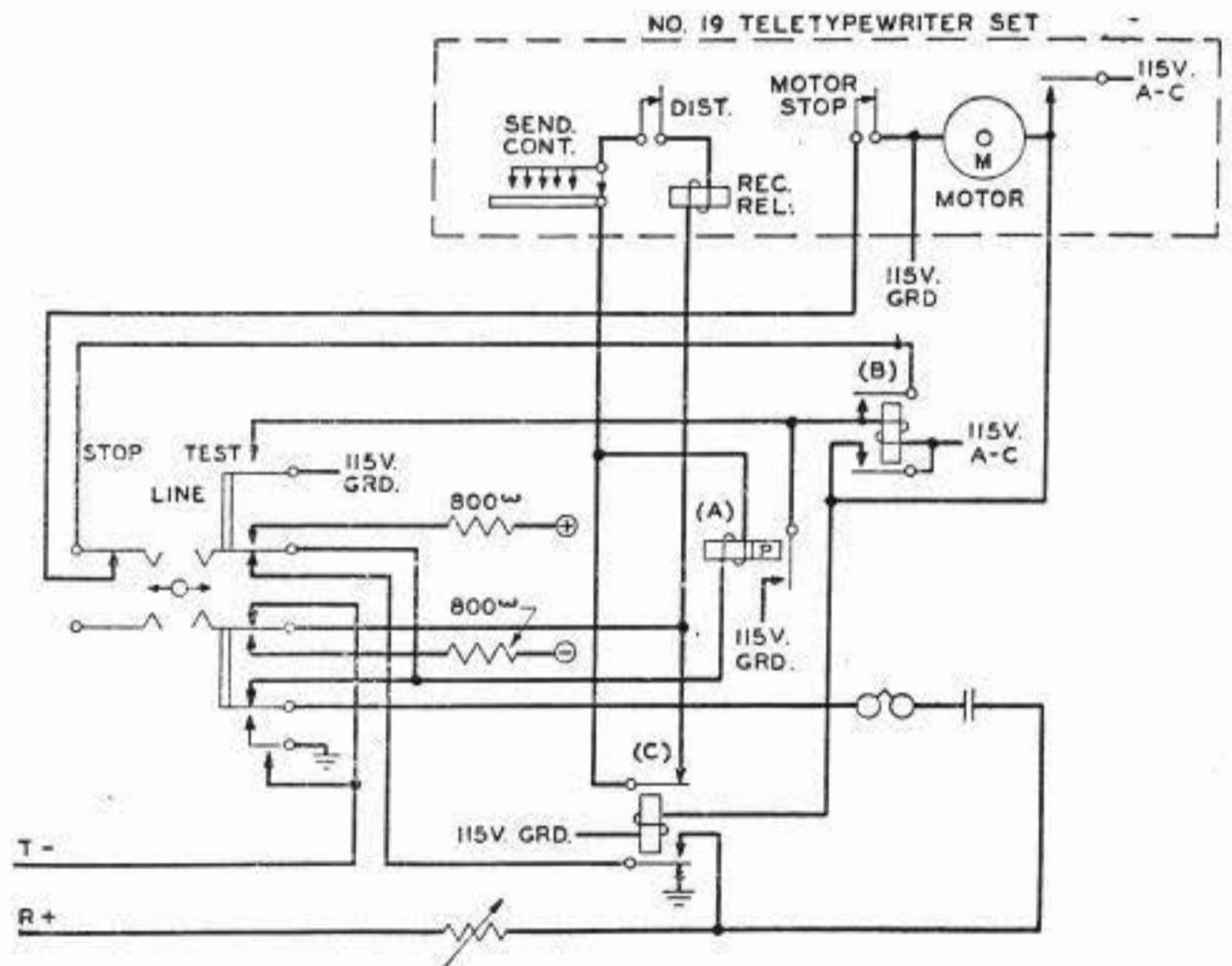


Fig. 3—Schematic of Application to No. 19 Teletypewriter Set

3.08 A 6017 type key, designated "test-line-stop," is added to provide the control features needed, and the "line-test" key in the teletypewriter is rewired to make it inoperative. The power switch in the table is wired as in normal operation but is left in the OFF position.

3.09 When the attendant wishes to call the operator, the "test-line-stop" key is operated momentarily to the TEST position (locking) and then to the LINE position. The operation to the TEST position connects power to relay (B), operating it, after which relay (C) operates. The teletypewriter is thus started, and when the key is restored to normal the line circuit is completed to call the operator. When the call is to be terminated, the "test-line-stop" key is operated momentarily to the STOP position (non-locking) and then allowed to come back to the LINE position. This opens the locking path of the (B) relay, and the line is placed in its idle condition.

3.10 When the teletypewriter is to be operated locally the "test-line-stop" key is operated to the TEST position. Relays operate and the teletypewriter is started as described in Paragraph 3.09. While the key is in the TEST position the tip conductor is grounded and the ring conductor is connected to the ringer, so a ringing signal can be received. When the local test is to be terminated the key is operated momentarily to STOP and then to LINE. This unlocks the (B) relay, which in turn releases the (C) relay, and the line is restored to the idle condition.

3.11 The remote starting and remote stopping are accomplished in the same manner as for the No. 15 teletypewriter described above.

#### **4. OPERATING METHODS**

4.01 The following gives the station operating procedures.

##### **Subscriber Calls Operator**

4.02 No. 15 Teletypewriter: Operate the power switch to the ON position.

4.03 No. 19 Teletypewriter Set: Operate the "test-line-stop" key momentarily to the TEST position and then restore it to the LINE position. If the machine is in the local test condition, restore the "test-line-stop" key to the LINE position.

### **Subscriber Recalls**

4.04 No. 15 Teletypewriter: Momentarily operate the power switch to the OFF position and restore it to the ON position.

4.05 No. 19 Teletypewriter: Operate the "test-line-stop" key in sequence to the STOP position, to the TEST position, and then to the LINE position.

### **Subscriber Disconnects**

4.06 No. 15 Teletypewriter: Operate the power switch to the OFF position.

4.07 No. 19 Teletypewriter Set: Momentarily operate the "test-line-stop" key to STOP and restore it to the LINE position.

### **Operator Calls Subscriber**

4.08 Attended Call—Operator applies ringing current to the loop. Unattended Start—Operator reverses the current in the tip conductor. Unattended Stop—Operator transmits to the station "Figs.," "Blank," and "H" in sequence.

### **Emergency Stop of Teletypewriter**

4.09 If the teletypewriter motor should become started and can not be stopped by the switchboard operator, it may be stopped locally by the attendant as follows:

(a) No. 15 Teletypewriter: Operate the power switch momentarily to the ON position.

(b) No. 19 Teletypewriter: Operate the "test-line-stop" key momentarily to the STOP position and then restore it to the LINE position.

### **Local Test**

4.10 No. 15 Teletypewriter: No local test feature is provided.

4.11 No. 19 Teletypewriter Set: Operate the "test-line-stop" key to TEST. To stop the teletypewriter without calling the operator—Operate the "test-line-stop" key momentarily to the STOP position and then restore it to the LINE position. To answer a call when the set is in local test—Operate the key to the LINE position.

## **5. INSTALLATION INFORMATION**

501 The station assembly and installation connections are shown on Plan drawings.