SUBSCRIBER SETS

700-TYPE

IDENTIFICATION, INSTALLATION, CONNECTIONS, AND MAINTENANCE

1. GENERAL

1.01 This section is reissued to:

- Show the 4159A network as MD
- Show the 4159B network to include protection
- Designate T and R leads for the derived and physical stations (Fig. 3)
- Show only one KS-20212 battery used in the 700B subscriber set

2. IDENTIFICATION

PURPOSE

(a) The 700-type subscriber set (the subscriber carrier terminal of the U1 subscriber loop carrier system) provides for:

(1) Adding a second line to a customer's permises using carrier-derived facilities without additional outside plant. The added derived line must be an individual line.

(2) Furnishing individual line service to a new customer location in areas lacking sufficient cable facilities or building wiring.

ORDERING GUIDE

(a) ***For physical and derived lines on same premise:***

- Set, Subscriber, 700A (without 40A power unit)
- Transformer, 2186A

(b) ***For physical and derived lines on separate premises:***

- Set, Subscriber, 700B (includes 40A power unit)
- ▶KS-20212 Battery◀

  (Order separately)
- Transformer, 2186A

  (Order separately)
- Unit, Power, 40A (converts 700A to 700B)
- Network, 4159A (MD) (includes protection)*
- ▶Network, 4159B (includes protection)*◀
- Apparatus Box, 117A1A* (note)

*Required when using 700B set to provide service on separate premises (see Section 462-275-201).

Note: ▶Because of the increased size of the 4159B network, the mounting bracket in the 117A1A apparatus box has been redesigned to permit housing the new network. Provisions are made for installing the new bracket in early production 117A1A apparatus boxes.◀

(c) ***Replaceable Components:***

- Circuit Pack, DL-1 (transmitter)—nearest to terminal board
- Circuit Pack, DL-2 (ringer amplifier and power)
- Circuit Pack, DL-3 (receiver)—farthest from terminal board

- Power Unit, 40A (to convert 700A to 700B subscriber set, add power unit)

DESIGN FEATURES

(a) Permits operation of two lines over a single nonloaded cable pair to the central office;

- A ***physical line*** operating at voice frequencies between CO and telephone set.

- A ***derived line*** provided by the 700-type subscriber set which transmits a frequency modulated carrier at 18KHz to the central office terminal and receives AM-FM carrier 30KHz from the CO.

(b) The telephone set(s) on the physical line are connected through a low pass filter in the 700-type subset when both lines are on the same premise. Optional wiring is provided in the subset, for use with an external network (4159-type) when the physical and derived lines are on separate premises.

(c) ◗Standby power for the derived line can be supplied by using one KS-20212 battery (part of 40A power unit in 700B subset) to ensure operation up to 5 hours off-hook or 15 hours on-hook, in the case of commerical power failure.◖

(d) The physical and derived lines can be used with either rotary or TOUCH-TONE® dialing.

(e) The 700-type subset requires 20 volts ac furnished by a 2186A transformer or it can be powered from -24 volts dc.

(f) The 700-type subscriber set is capable of operating a maximum of three ringers on the derived line. If more than one ringer is provided on the derived line the ringer bias spring must be placed in the low notch on all

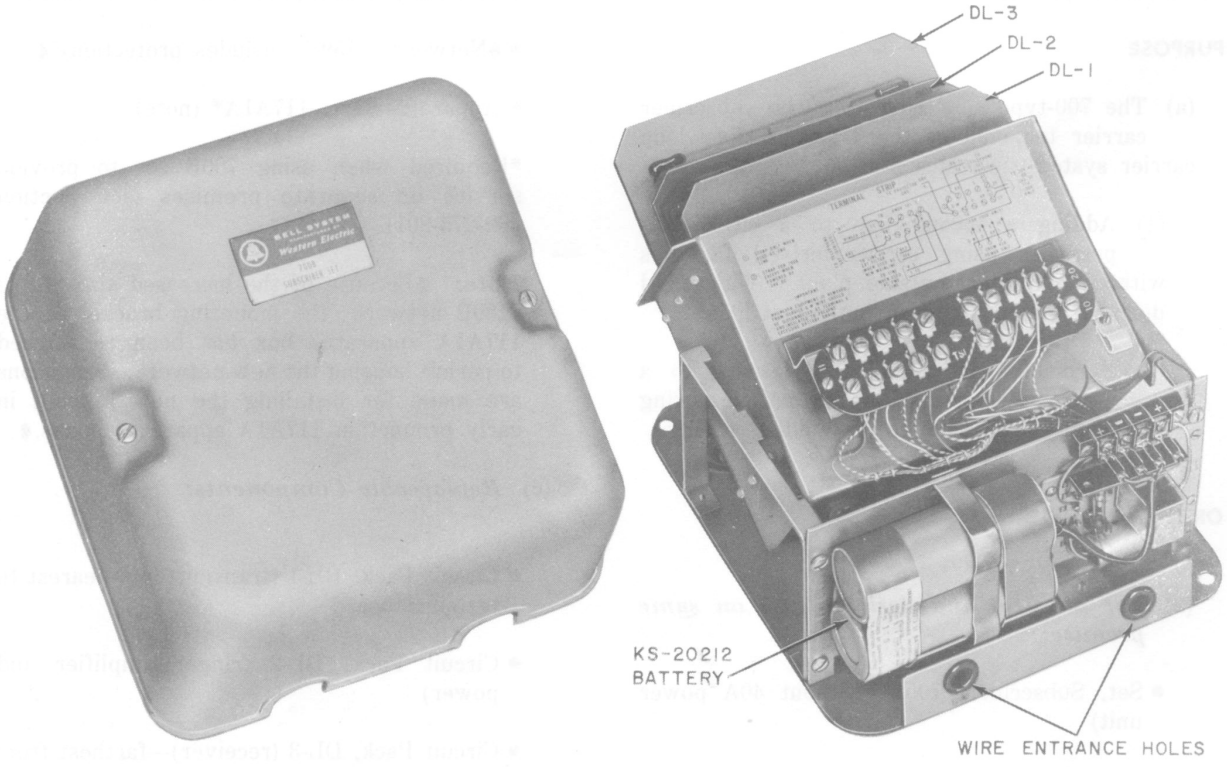


Fig. 1—700B Subscriber Set

sets and the proper ringer connections have to be made (see Fig. 3).

APPLICATION

(a) The U1 carrier system can be used on any nonloaded resistance designed loop with a maximum length of 18Kf of mixed gauge or 15Kf of 26 gauge. In most cases, the carrier system will accommodate up to 6Kf of bridge tap.

(b) The carrier system will not work on loaded cable pair or through bridge lifters.

(c) The derived line must be on individual line service with tip ringing as shown in Fig. 3.

(d) A coin telephone may be used as the physical line. ***Use of the derived line for a coin telephone installation is prohibited.***

2. INSTALLATION

(a) When using the U1 carrier system to provide a second line for the same customer, the 700A Subscriber Set should be utilized (Fig. 2). In the event of commerical power failure, the derived line will be inoperative but the customer will have access to the physical line for service.

(b) ▶When the derived line is utilized for service to a customer location other than that of the physical line, the 700B subset should be installed. This set includes the 40A power unit necessary to provide standby power to the derived line in the case of power failure. The one KS-20212 battery must be ordered and installed separately.◀

(c) Install the 700-type subset at location of the derived line customer. When the physical and derived lines are for the same customer on the same premise, provide wiring as shown in Fig. 2A. When physical line provides service for a different customer use external network (4159-type) as shown in Fig. 2B. The derived station must be within 1000 feet of the network. Refer to Section 462-275-201 for information on the 4159-type network.

(d) All telephone sets on the derived line must be within 100 ohms loop resistance (1200 feet of 26 gauge conductor) of the 700-type subset.

(e) When a 700B subset is installed, the KS-20212 battery should be installed and 2186A transformer wiring connected to subset first. This is required to charge the battery which is shipped in a discharged state. Approximately 1/2 hour charging should be sufficient to permit making necessary installation tests.

(f) The 2186A transformer must be installed within 10 inches of a 105-129 volt 60Hz ac outlet, not under control of a switch.

(g) The 700-type subset and 2186A transformer should be installed indoors in garage, basement, closet, or utility room areas, providing temperature ranges do not exceed the following:

- 700A—0° F to 140° F
- 700B—40° F to 100° F

(h) Mount the subset to a firm surface using the associated backplate for mounting.

(i) A connecting block, such as a 44A or 30A, can be used as a bridging point for all wiring as shown in Fig. 2 or all wiring can be run directly to the subset.

(j) Local wiring is brought into the subset through the grommeted holes in the bottom and routed behind the 40A power unit, when supplied, to the terminal strip. A connecting diagram is furnished in the subset to facilitate wiring.

(k) Ringers in all telephone sets associated with the physcial line should be connected as individual or bridged. Ringers in all sets associated with the derived line (maximum of three) should be connected as a tip party and connected between the tip side of the line and the RINGER lead to the subset (Fig. 3). ***Do not connect the ringer lead to ground.*** Move the ringer biasing spring to the low notch on all ringers (if more than one is used) associated with the derived line only.

(l) ▶Both the physical and derived lines should be tested for dialing, ringing, and talking when installation is completed. In addition, derived lines equipped with 700B subscriber sets should be tested with commerical power

disconnected to ensure proper operation of the battery as a standby power supply.◀

3. CONNECTION INDEX

Fig. 3—700-Type Subscriber Set, Connections

SD-1C151-01—A complete schematic of the 700-type subscriber set

4. MAINTENANCE

(a) Verify that CO carrier and cable facilities have been cleared of trouble before making any maintenance checks of the 700-type subsets.

(b) The circuit packs (Fig. 1) can be removed by tilting top of holder forward and carefully pulling the boards from their connectors.

(c) Maintenance of the 700-type subset should be limited to the tests listed below, replacement of circuit packs, entire subsets or batteries and verification of wiring and power to the unit. No adjustments for frequency should be required or attempted in the field.

(d) Maintenance tests—physical line

- Make the standard installation tests of the physical line such as dialing, ringing, and talking.

(e) Maintenance tests—derived line

- No sidetone with line switch operated—check wiring between telephone set and subset, and between transformer and subset. If no trouble is found, replace circuit card DL-2 (middle card) or whole subset and retest.

- No dial tone—replace DL-3 (farthest from terminal strip), DL-1 (closest to terminal strip) and DL-2, in that order, testing for dial tone after replacing each card. If still inoperative, replace entire subset and retest.

- Receive dial tone but bell does not ring—monitor across line at telephone set with hand test set for ringing signal. If signal is not being received, replace DL-2 and retest. If signal is received but ring is weak or erratic, check that biasing spring is in low notch on all ringers (maximum of three). If still weak, replace DL-2 first, then DL-3 or entire subset.

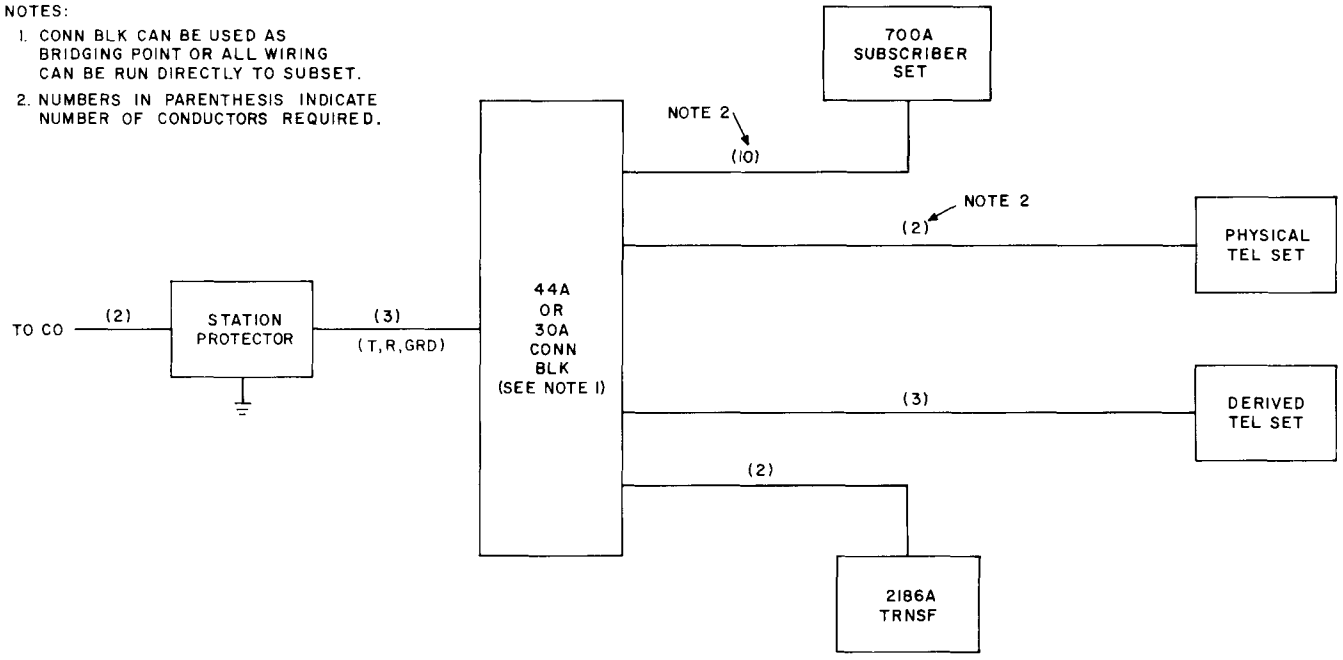
- Cannot hear—make same tests as for no dial tone.

- Cannot be heard—replace DL-1, then DL-2 or entire subset and retest.

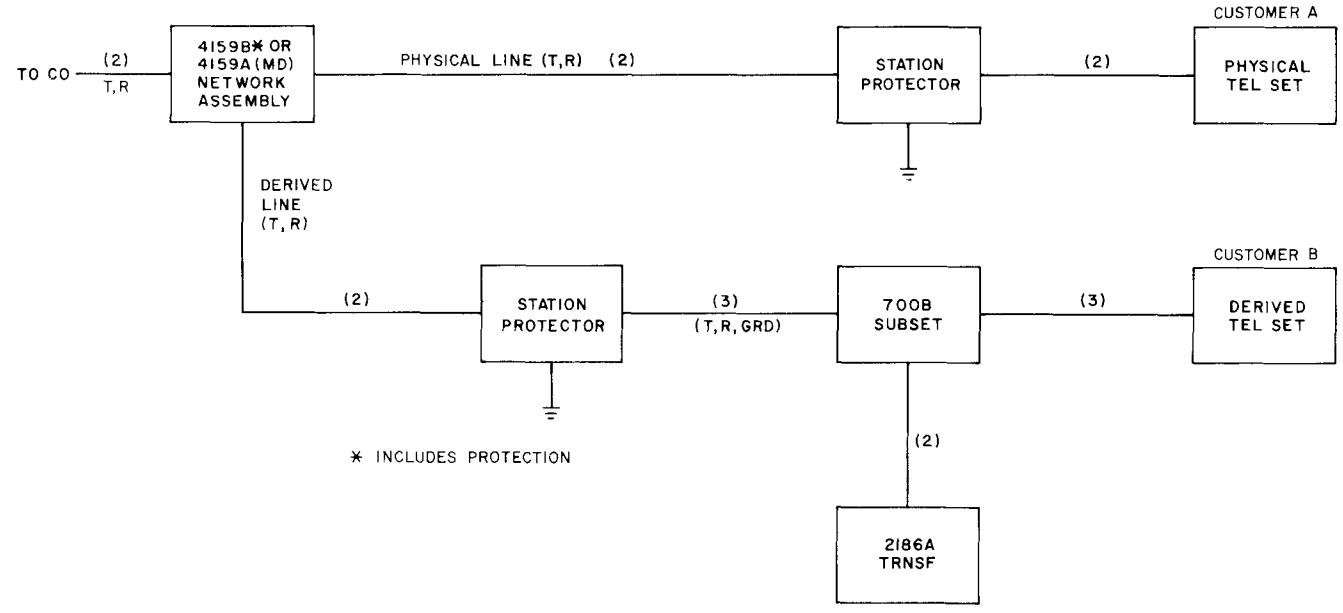
- Reaches wrong numbers when dialing—replace DL-2 or entire subset and retest.

- Loud, squawky noise in receiver—carrier connections to the line are open.

- Low frequency in band tone appearing on long loops—indicates the carrier frequency oscillator is no longer on 18KHz. Replace DL-1.

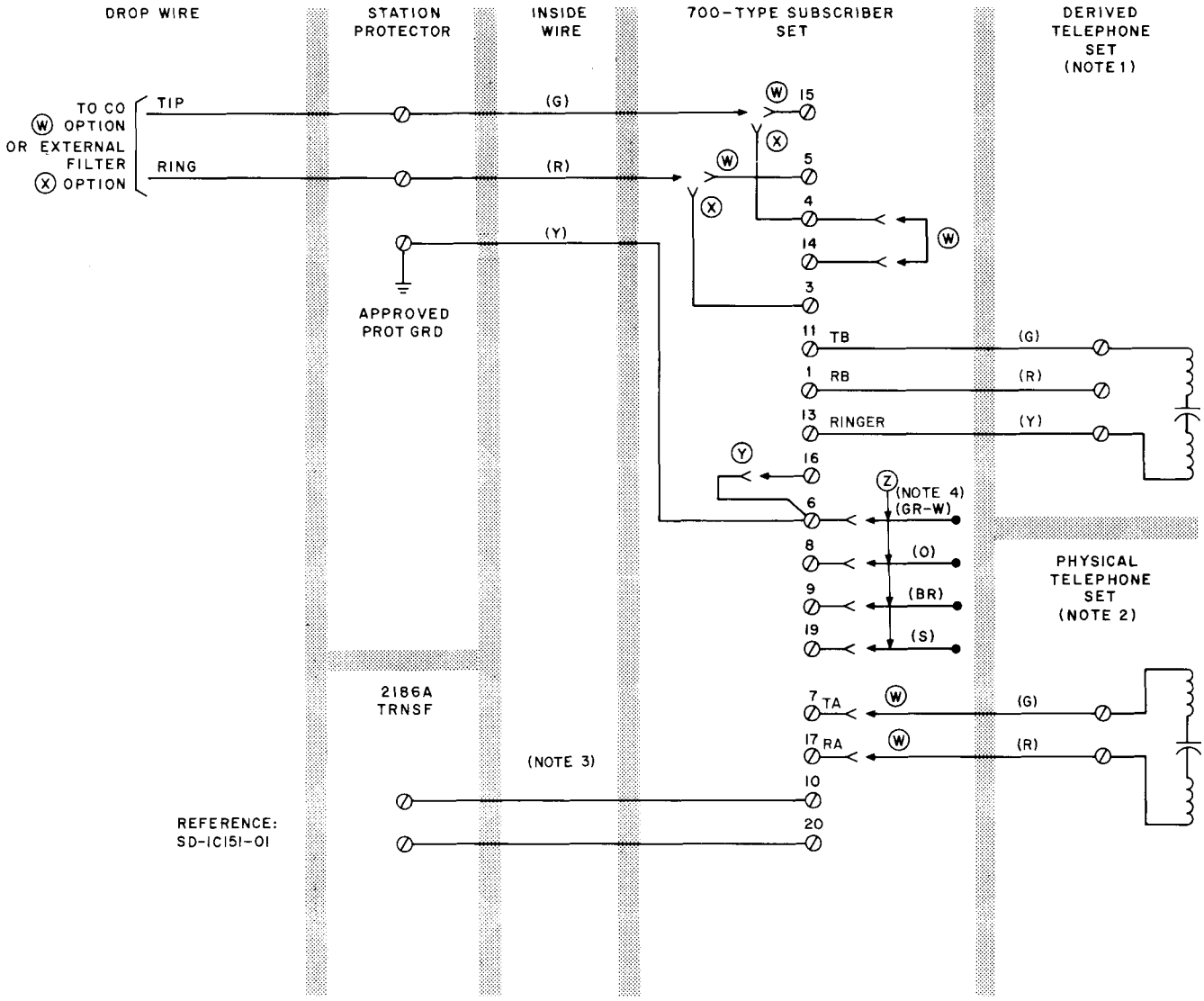


(A) PHYSICAL AND DERIVED LINES ON SAME PREMISE



(B) PHYSICAL AND DERIVED LINES ON SEPARATE PREMISES

Fig. 2—Block Diagram—U1 Carrier System



(W) DERIVED AND PHYSICAL LINES ON SAME PREMISE.

(X) DERIVED AND PHYSICAL LINES ON SEPARATE PREMISES PHYSICAL LINE CONNECTED TO EXTERNAL FILTER.

(Y) 700A SUBSCRIBER SET – WITHOUT BATTERY.

(Z) 700B SUBSCRIBER SET – WITH BATTERY.

NOTES:

1. CONNECT ALL RINGERS (MAXIMUM 3) AS TIP PARTY. DO NOT CONNECT RINGER OF DERIVED TELEPHONE SET(S) TO GROUND.
2. CONNECT ALL RINGERS OF PHYSICAL TELEPHONE SET(S) AS BRIDGED OR INDIV. PARTY.
3. USE 18 GA. OR EQUIVALENT. QUAD JKT OR D STATION WIRE MAY BE USED BY DOUBLING CONDUCTORS.
4. WHEN REMOVING 700B SUBSCRIBER SET FROM SERVICE DISCONNECT BATTERY BY REMOVING (G-W) WIRE FROM TERMINAL 6. (INSULATE AND STORE).

Fig. 3—700-Type Subscriber Set, Line Connections