

## 130-TYPE TELETYPEWRITER SUBSCRIBER SET

### DESCRIPTION

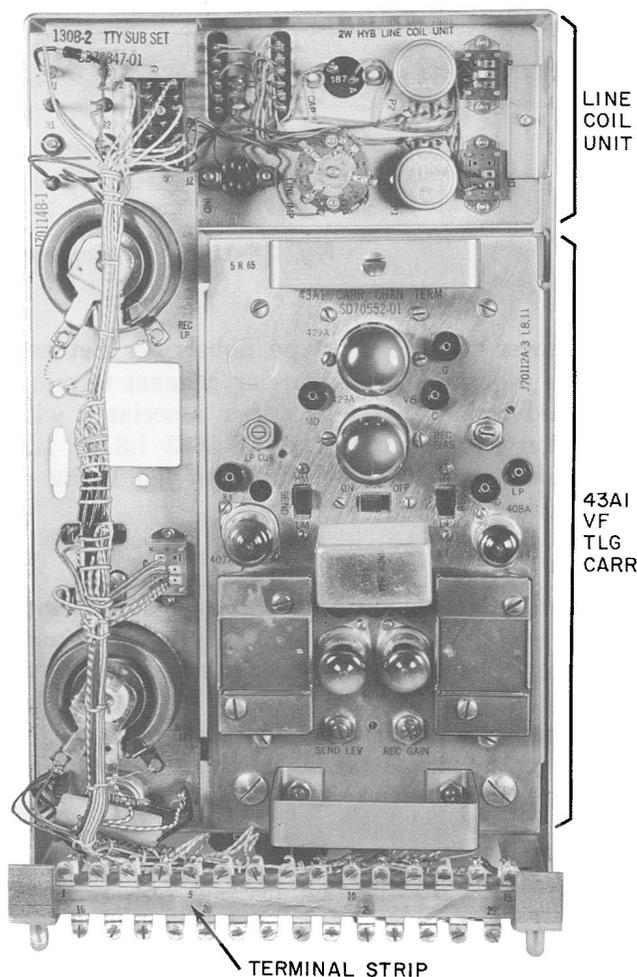
CONTENTS	PAGE
1. GENERAL . . . . .	1
2. DESCRIPTION . . . . .	2
A. General . . . . .	2
B. Power . . . . .	3
C. Line Relay Operation . . . . .	3
D. Carrier Fail (CF) Indication Operation . . . . .	3
E. Line Transformer . . . . .	4
F. Private Line Service (PLS) . . . . .	4
3. REFERENCES . . . . .	4

#### 1. GENERAL

**1.01** This section describes the 130-type Teletypewriter (TTY) Subscriber Sets. Each subscriber set consists of a connector for a 43A1 carrier channel terminal and a small amount of equipment, all mounted on a metal framework. The complete TTY subscriber set is arranged for mounting in a TTY table, on a floor stand, or in stand-alone cabinets.

**1.02** This section is reissued to delete information covering the 130B1 TTY Subscriber Set, to delete the figures covering the schematics of the subscriber set, and to add information concerning the 130C1 Subscriber Set. This reissue agrees with Issue 10D of SD-70847-01. Although the 130B2 Subscriber Set is also rated Manufacture Discontinued (MD) along with the 130B1, information for the 130B2 is retained in this section for the subscriber sets still in operation. Due to extensive changes, change arrows have been omitted.

**1.03** The 130B2 (Fig. 1) and 130C1 (Fig. 2) Subscriber Sets, which have similar circuits but different equipment arrangements, may be operated on a 2-wire, 4-wire, or hybrid basis. These subscriber sets are designed primarily for use at the customer's location for PLS.



**Fig. 1—130B2 Teletypewriter Subscriber Set, Cover Removed—Front View**

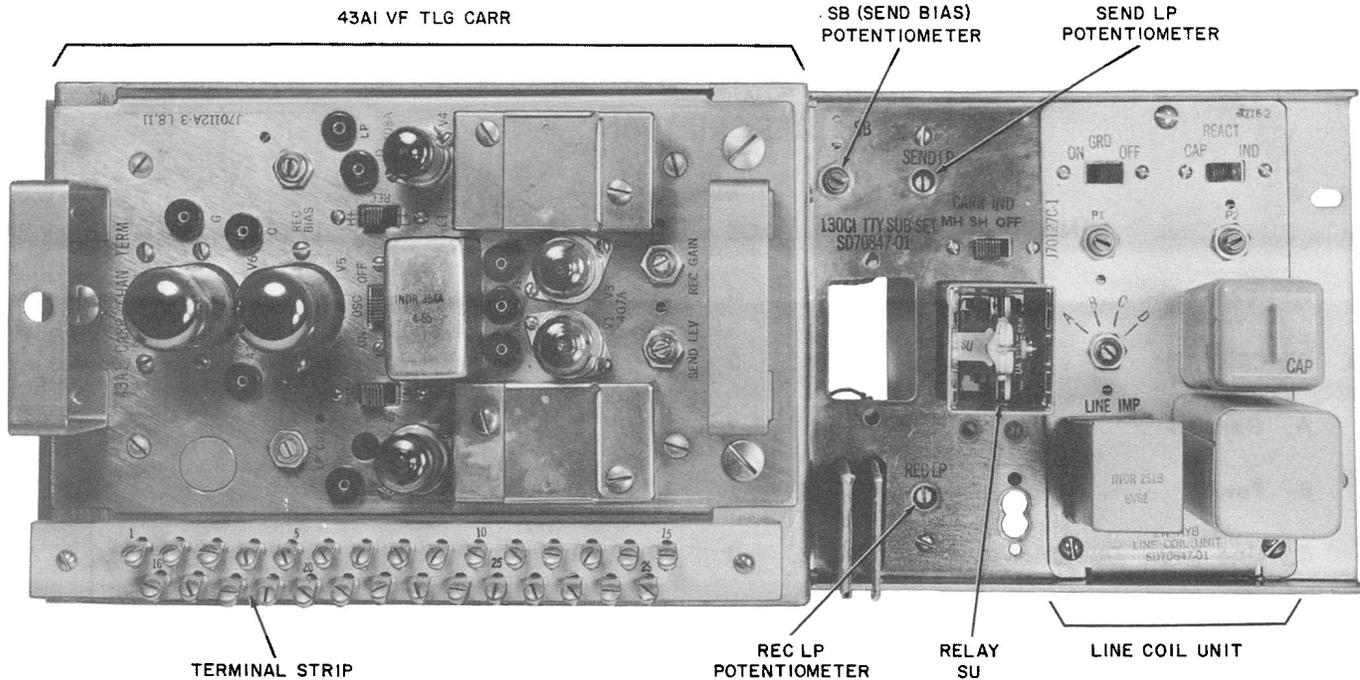


Fig. 2—130C1 Teletypewriter Subscriber Set, Front View

**1.04** Power for the 130-type Subscriber Set and its associated 43A1 carrier channel terminal is supplied by a separate rectifier associated with the station equipment. The KS-5663 L8 or L10 (or equivalent) rectifier is used with the 130B2 or 130C1 Subscriber Set.

**1.05** In PLS, two locations, each equipped with a 130-type Subscriber Set and associated 43A1 carrier channel terminal (with proper networks installed) may be connected directly. Multipoint service may be provided when stations are connected through central office terminals and terminated in No. 2 type hubs.

**1.06** Although the illustrations and text refer to the output tubes of the 43A1 carrier channel terminal as 429A electron tubes, the use of a 262C switch (with its associated 4143-type network) is gradually replacing the use of 429A electron tubes. Detailed information for the use of the 262C switch and the 4143-type network, proper channel terminals, etc, is covered in the section entitled 43A1 Carrier Telegraph Terminal, Description (312-700-100).

## 2. DESCRIPTION

### A. General

**2.01** The principal components of a 130-type Subscriber Set are as follows:

- (a) The impedance matching transformer between the balanced line circuit and the unbalanced circuit of the 43A1 carrier channel terminal
- (b) Resistors and rheostat for adjusting the loop current in the local circuit of the TTY or customer-provided terminal equipment

**Note:** The term TTY will be used in this section to denote any associated terminal equipment (Bell System- or customer-provided) used with the 130-type TTY Subscriber Set.

- (c) A 43A1 carrier channel terminal equipped with the appropriate send (453-type) and receive (454-type) networks

(d) Power supply (KS-5663 L8 or L10, or equivalent) for the 43A1 carrier channel terminal and the local TTY loop.

**2.02** A block diagram showing the relationship of the 130-type Subscriber Set to the other units of the station is shown in Fig. 3.

### B. Power

**2.03** Power arrangements for the 130-type Subscriber Set are as follows.

(a) The 130-type Subscriber Set supplies the power connection to the 43A1 channel terminal and for current from the channel terminal to the local TTY loop. The rectifier associated with the subscriber set furnishes the following:

- (1) 130 volts dc for electron tube plate and screens of the 43A1 channel terminal
- (2) 130 volts dc for the local TTY loop circuit (20 or 62.5 mA)

(3) 20 volts ac for the electron tube filaments in the 43A1 channel terminal.

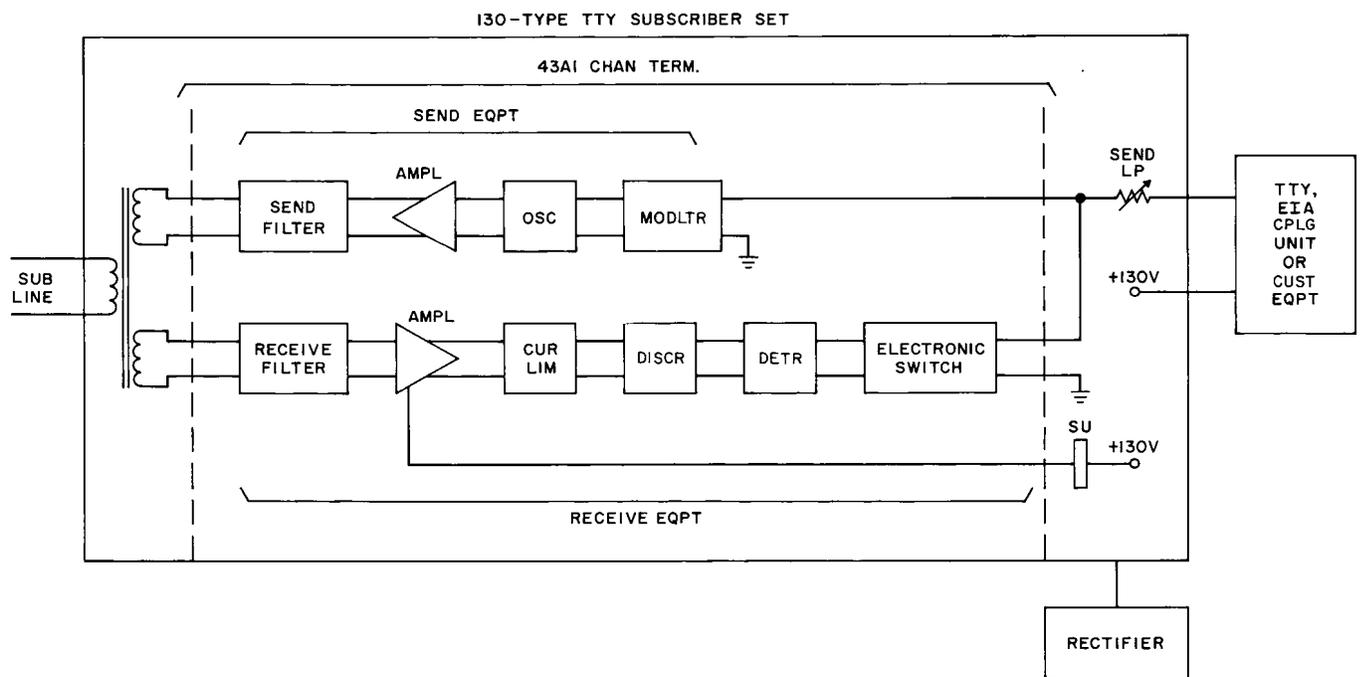
### C. Line Relay Operation

**2.04** For 62.5 mA full-duplex or 62.5 mA half-duplex operation with a line relay, a second rectifier is required.

### D. Carrier Fail (CF) Indication Operation

**2.05** The 130-type Subscriber Set is provided with relay contacts in series with the receive leg of the 43A1 carrier channel terminal. These contacts are associated with a relay connected to the received supervisory circuit (one-half of the V2 electron tube) of the 43A1 carrier channel terminal. In the event that the incoming carrier frequencies fall below a predetermined level, the received supervisory circuit functions and a CF condition is initiated.

**2.06** The 130B2 and 130C1 Subscriber Sets are each equipped with a switch (C1) to control the CF feature. The C1 switch can provide three types of signals to the TTY. The OFF position of the 3-position switch disables the CF feature. The SH position provides for space hold operation



**Fig. 3—Block Diagram, Teletypewriter Station Using 43A1 Carrier Channel Terminal Mounted in 130-Type Teletypewriter Subscriber Set—Half-Duplex Operation**

(TTY runs open on loss of carrier) while the MH position provides for mark hold operation when the received supervisory circuit operates. The normal operation of the 130-type Subscriber Set is, however, with this switch to the OFF position; ie, with the CF indication disabled.

**Note:** When the mark hold operation is specified and the terminal equipment is a TTY, M option must be used to limit the current to the TTY when the CF Indicator operates from loss of received carrier.

#### E. Line Transformer

**2.07** Since the 43A1 channel terminal is required to work into lines having a wide range of impedances, the 130-type Subscriber Set has an adjustable impedance matching transformer. This transformer is capable of providing an approximate match between the 600-ohm channel filter of the 43A1 terminal and the line. The line transformer arrangement is used for all channels except where it is necessary to use adjacent sending and receiving channel frequencies. When adjacent sending and receiving frequencies are used, and the level of the sending frequency exceeds the level of the receiving frequency by approximately 15 dB in either voice- or above voice-frequency range, a hybrid transformer with an adjustable balancing network is required. The difference in level which may be tolerated is also dependent upon the noise level present in the system. The hybrid transformer augments the discrimination when adjacent frequencies are used for sending and receiving. The procedure for obtaining a hybrid balance is described in the section entitled 130-Type Teletypewriter Subscriber Set, Tests and Adjustments (570-303-503).

**2.08** Each of the line transformer circuits are provided as a plug-in unit for ease in converting the subscriber sets from one type of operation to another. A ground (GRD) switch is provided on each of the plug-in units which, on the 2- and 4-wire units, grounds the center tap of the line transformer. In the hybrid transformer unit, the switch is used to ground the center of the primary winding of the hybrid transformer when its two primary windings are connected in series. The grounding of the center tap of these transformers may aid in reducing the effect of longitudinal currents when open wire line facilities are used.

#### F. Private Line Service (PLS)

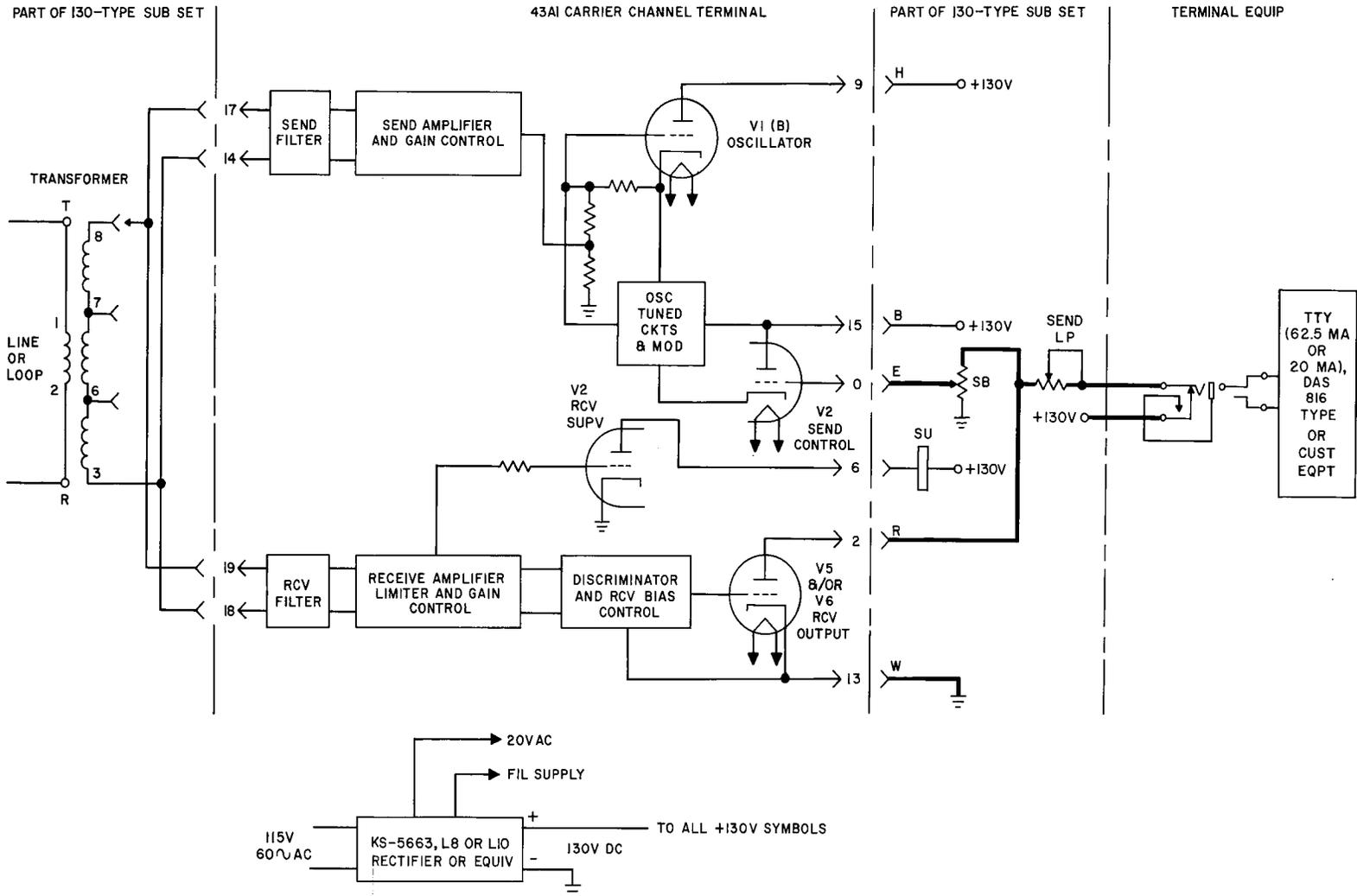
**2.09** A simplified schematic of the 130-type Subscriber Set and the associated 43A1 carrier channel terminal used for PLS half-duplex operation is shown in Fig. 4. The corresponding dc circuits for full-duplex operation are shown in Fig. 5. The 130-type Subscriber Set may be arranged to operate either half- or full-duplex by means of external strapping on the screw-type terminal strip.

**2.10** When 62.5 mA operation is required by the terminal equipment, both electron tubes V5 and V6 in the 43A1 carrier channel terminal are required and are operated in parallel. For 20-mA operation, only electron tube V5 is required and electron tube V6 is removed.

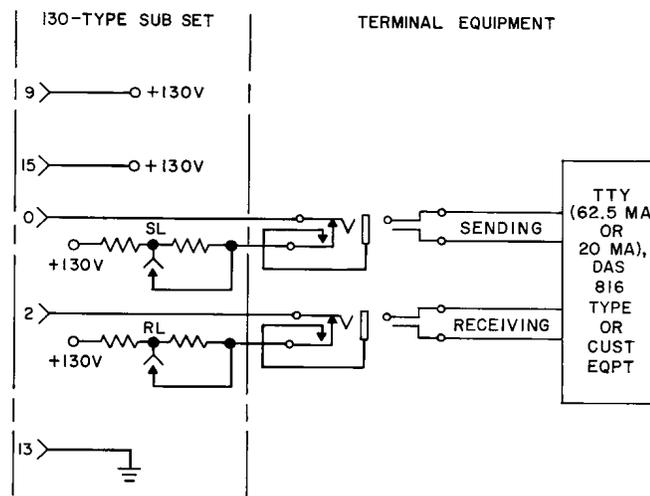
#### 3. REFERENCES

**3.01** The following Bell System Practices pertain to the 130-type Subscriber Set and its associated 43A1 carrier channel terminal:

SECTION	TITLE
570-303-103	130-Type Teletypewriter Subscriber Set, Description
570-303-203	Installation
570-303-503	Tests and Adjustments
312-700-100	43A1 Carrier Telegraph Terminal, Description
570-003-010	Electrical Service for Teletypewriter Apparatus
570-302-100	Rectifiers for Teletypewriter Station Apparatus, Description.
<b>3.02</b>	The following schematic drawings (SDs) and circuit descriptions (CDs) pertain to the equipment required at the 130-type Subscriber Set installation:
SD- & CD-70847-01	130B2 and 130C1 Teletypewriter Subscriber Sets
SD- & CD-70735-01	Connecting Circuits for Use with 28 TTYs
SD- & CD-70552-01	43A1 Carrier Telegraph Terminal.



**Fig. 4—Teletypewriter Station Using 130-Type Subscriber Set and Associated 43A1 Carrier Channel Terminal— Private Line Service— Half-Duplex**



**Fig. 5—Teletypewriter Station Set (130-Type) Used for Private Line Service—Full-Duplex**