## 28 ELECTRICAL SERVICE UNITS

### WIRING DIAGRAM

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GENERAL</td>
<td>1</td>
</tr>
<tr>
<td>2. 28 ELECTRICAL SERVICE UNIT WIRING DIAGRAMS</td>
<td>3</td>
</tr>
<tr>
<td>28A electrical service unit</td>
<td>3</td>
</tr>
<tr>
<td>28B electrical service unit</td>
<td>5, 7</td>
</tr>
<tr>
<td>28C electrical service unit</td>
<td>9</td>
</tr>
<tr>
<td>28D and 28U electrical service units</td>
<td>11</td>
</tr>
<tr>
<td>28D-1 electrical service unit</td>
<td>13</td>
</tr>
<tr>
<td>28D-2 electrical service unit</td>
<td>15</td>
</tr>
<tr>
<td>28E and 28W electrical service units</td>
<td>17</td>
</tr>
<tr>
<td>28E-1 electrical service unit</td>
<td>19</td>
</tr>
<tr>
<td>28F electrical service unit</td>
<td>21</td>
</tr>
<tr>
<td>28F-1 electrical service unit</td>
<td>23</td>
</tr>
<tr>
<td>28G electrical service unit</td>
<td>25</td>
</tr>
<tr>
<td>28G-1 electrical service unit</td>
<td>27</td>
</tr>
<tr>
<td>28H electrical service unit</td>
<td>29</td>
</tr>
<tr>
<td>28J electrical service unit</td>
<td>31</td>
</tr>
<tr>
<td>28K electrical service unit</td>
<td>33</td>
</tr>
<tr>
<td>28L electrical service unit</td>
<td>35</td>
</tr>
<tr>
<td>28LA electrical service unit</td>
<td>37</td>
</tr>
<tr>
<td>28LB electrical service unit</td>
<td>39</td>
</tr>
<tr>
<td>28LC and 28LC-1 electrical service units</td>
<td>41</td>
</tr>
<tr>
<td>28LD and 28LD-1 electrical service units</td>
<td>43</td>
</tr>
<tr>
<td>28M electrical service unit</td>
<td>45</td>
</tr>
<tr>
<td>28N electrical service unit</td>
<td>47</td>
</tr>
<tr>
<td>28N-1 electrical service unit</td>
<td>49</td>
</tr>
<tr>
<td>28P electrical service unit</td>
<td>51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>28P-1 electrical service unit</td>
<td>53</td>
</tr>
<tr>
<td>28R electrical service unit</td>
<td>55</td>
</tr>
<tr>
<td>28S electrical service unit</td>
<td>57</td>
</tr>
<tr>
<td>28T electrical service unit</td>
<td>59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 28 ELECTRICAL SERVICE UNIT SUBASSEMBLY WIRING DIAGRAMS</td>
<td>61</td>
</tr>
</tbody>
</table>

1. GENERAL

1.01 This section shows the wiring of 28 electrical service units and 28 electrical service unit subassemblies.

1.02 The wiring diagrams are shown in alphabetical order except the wiring diagrams for the 28U and 28W electrical service units. The 28D and 28U electrical service units are shown in the same figure. The 28E and 28W electrical service units are shown in the same figure.
2. 28 ELECTRICAL SERVICE UNIT WIRING DIAGRAMS

Figure 1 - 28A Electrical Service Unit
PRIOR TO OR UPON INSTALLATION
HEAVY TO BE MADE
CONNECTIONS SHOWN
ELECTRICAL SERVICE UNIT
1TY CABINET BLOCK
SELECTOR BK
(1) KEYBOARD OR RECEIVING ONLY BASE CONNECTOR
TERMINAL BLOCK
CABINET
ELECTRICAL SERVICE UNIT

Figure 2A - 28B Electrical Service Unit

Page 5
CONNECTIONS SHOWN
HEAVY TO BE MADE
PRIOR TO OR UPON
INSTALLATION

(1) CABLE TERMINAL BLOCK

(2) LINE TEST KEY TERMINAL BLOCK

(3) LINE SHUNT RELAY

(4) KEYBOARD OR RECEIVING ONLY BASE CONNECTOR

(5) TAPE W-G

(6) TAPE W-G

(7) TAPE W-G

(8) TAPE W-G

(9) TAPE W-G

(10) TAPE W-G

(11) TAPE W-G

(12) TAPE W-G

(13) TAPE W-G

(14) TAPE W-G
NOTES:
1. CIRCUITS SHOWN FOR .060 AMP NEUTRAL SIGNAL LINE OPERATION. FOR .020 AMP OPERATION MOVE STRAP TO TERMINAL 3 & 4 ON (J) TS.
2. THE 28U ELECTRICAL SERVICE UNIT IS THE SAME AS THE 28D ELECTRICAL SERVICE UNIT EXCEPT THAT IT IS EQUIPPED WITH AN ELECTRONIC SELECTOR MAGNET DRIVER INSTEAD OF A LINE RELAY MOUNTING ASSEMBLY AND RECTIFIER. SEE SPECIFICATION 500425.

Figure 4 - 28D and 28U Electrical Service Units
NOTES:
1. CIRCUITS SHOWN FOR 0.60 AMP NEUTRAL SIGNAL LINE OPERATION. FOR 0.20 AMP OPERATION MOVE STRAP TO TERMINAL 3 & 4 ON (J) TS.
2. THE 28U ELECTRICAL SERVICE UNIT IS THE SAME AS THE 28D ELECTRICAL SERVICE UNIT EXCEPT THAT IT IS EQUIPPED WITH AN ELECTRONIC SELECTOR MAGNET DRIVER INSTEAD OF A LINE RELAY MOUNTING ASSEMBLY AND RECTIFIER. SEE SPECIFICATION 50-0425.
NOTES:
1. CIRCUITS SHOWN FOR 060 AMP NEUTRAL SIGNAL LINE
   OPERATION FOR 020 AMP OPERATION REMOVE AND ADD
   CONNECTIONS AS TABULATED BELOW.
   SIGNAL LINE CURR CONNECTION REMOVED CONNECTION ADDED
   020 AMP J1-J2 J3-J4
Figure 6 - 28D-2 Electrical Service Unit

1. TAPPED DRAWN FOR 0.025 AMP ELECTRICAL SIGNAL LINE OPERATION FOR 0.025 AMP OPERATION REMOVED. AND OR CONNECTIONS AS SHOWN BELOW.

<table>
<thead>
<tr>
<th>SIGNAL LINE CURRENT</th>
<th>CONNECTION TERMINAL CONNECTION SIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.025 AMP</td>
<td>21-12</td>
</tr>
</tbody>
</table>

2. RECTIFIER DRAWN CONTROLLED BY POWER SWITCH FOR CONTINUOUS OPERATION REMOVE LED-1-8 AND CONNECT TO TERMINAL 1 0F 1 POWER TERMINAL BLOCK.

3. SELECTOR MAGNETS CAN BE CONNECTED DIRECTLY IN THE SIGNAL LINE CIRCUIT FOR NEUTRAL OPERATION AS FOLLOWS:

A) REMOVE LINE RELAY
B) 25 MILLIAMP: 63 675 WPM OPERATION (OR ANY INTERMEDIATE SPEED)
   1) STRAP BK 18 BK
C) 50 MILLIAMP: 63 75 100 WPM OPERATION (OR ANY INTERMEDIATE SPEED)
   1) STRAP BK 18 BK
D) 60 MILLIAMP: 60 80 100 WPM OPERATION

Page 15
1. Circuits shown for 0.060 AMP neutral signal line operation for 0.060 AMP operation remote and 0.033 connections as tabulated below.

<table>
<thead>
<tr>
<th>Signal Line Current</th>
<th>Connection Remote</th>
<th>Connection Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.060 AMP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Rectifier shown controlled by power switch for continuous operation remote leads 12-48 from terminal 2 and connect to terminal 1 of C power terminal block.

3. Selector magnets can be connected directly in the signal line circuit for neutral operation as follows:

   a) Remote line relay
      b) 35 milliamperes 60 & 75 WPM operation (or any intermediate speeds)
      1) Strap 53 to 53
      2) Move blue lead from terminal 68 to terminal 88
      3) 16 milliamperes, 60 & 75 WPM operation (or any intermediate speeds)
      1) Strap 53 to 53
      2) Move blue lead from terminal 68 to terminal 88
      3) Change wiring on selector magnets for 60 milliamperes operation

Electrical Service Unit Ground Screw

Connector Plug
NOTES:

1. CIRCUITS SHOWN FOR 200 AMP NEUTRAL SIGNAL LINE OPERATION.
   FOR 200 AMP OPERATION REMOVE AND WIRE CONNECTIONS AS
   INSTRUCTED BELOW.

   SIGNAL LINE CURRENT 200 AMP
   CONNECTION MODIFIED 6-7-43
   MODIFICATIONS ADDED 3-25-43

2. THE SPARE LEADS FROM THE KEYBOARD AND TRANSMITTER DISTRIBU- 
   TOR UNITS CONNECTOR PLUGS ARE TERMINATED IN THE 
   DISTRIBUTOR PLUGS; THE DUMMY DIALS ARE TERMINATED IN THE 
   DISTRIBUTOR. THE SPARE LEADS FROM THE TYPING UNIT PLUGS ARE TERMINATED IN THE 
   LEFT END OF THE ELECTRICAL SERVICE UNIT.

3. SPARE LEADS FROM 1-10 AND 11-12 ARE RESERVED FOR FUTURE 
   OPERATION OF KEYBOARD AND TRANSMITTER DISTRIBUTOR 
   SIGNAL GENERATORS.

4. ELECTRICAL SERVICE UNIT AND CABINET ARE SHOWN WIRING 
   FOR OPERATION OF START MOTOR OF 200 OR 200 TRANSMITTER 
   DISTRIBUTOR ON AC. WHEN 120 VOLTS DC IS TO BE USED 
   WIRE AS FOLLOWS:
   UNIT (C-1) TO C-(12)
   C-(12) TO C-(1)
   C-(2) TO C-(12)
   C-(12) TO C-(2)

5. IF A 200 OR 200 TRANSMITTER DISTRIBUTOR UNIT IS INSTALLED 
   ALSO ADD:
   C-(12) TO C-(12)
   C-(43) TO C-(14)

6. C-(2) AND C-(3) ARE SHOWN ON 200 AND 200 TRANSMITTER 
   DISTRIBUTOR HOUSINGS DRAWING.

Figure 9 - 28F Electrical Service Unit
Figure 10 - 28F-1 Electrical Service Unit
ISS 1, SECTION 573-133-400

Figure 11 - 28G Electrical Service Unit
Figure 12 - 28G-1 Electrical Service Unit
Figure 13 - 28H Electrical Service Unit
Figure 15 - 28K Electrical Service Unit
Figure 17 - 28LA Electrical Service Unit

NOTES:
1. UNIT WORED FOR 115 VOLTS, 60 CYCLE A.C. POWER INPUT ONLY.
2. SWITCH Q CONTROLS ALL OF ELECTRICAL SERVICE UNIT AND RELATED OUTGOING CABLES EXCEPT FOR CONVENIENCE OUTLET (P).
3. SWITCH ON FRONT OF CABINET CONTROLS F, T & CODOMAT CABLES AND PA OUTLETS.
4. WHEN END OF LINE INDICATOR LAMP IS FURNISHED WITHOUT COPYRIGHTS.
5. WHEN END OF LINE INDICATOR LAMP IS FURNISHED WITH COPYRIGHTS.
(LA) TP144620
REC LINE RELAY MOUNTING ASSEMBLY

(UB) TP144621
SLR LINE RELAY MOUNTING ASSEMBLY

(LB) STC KEY TERMINAL BLOCK

Figure 18 - 28LB Electrical Service Unit
Figure 19 - 28LC and 28LC-1 Electrical Service Units
I 

\[ \text{NOTE:} \]

1. THE CABLES USED ARE THE FOLLOWING:

- CABL E ASSEMBLY W/LAC 215 W/LBAC 227
- F 143392 143394
- S 143285 143284

2. AUDIBLE ALARM MUST BE FURNISHED BY CUSTOMER.

3. SWITCH Q MUST BE IN "OFF" POSITION WHEN LESU IS INSTALLED IN 28 LB APP CAB.

4. TO CONNECT AUXILIARY PRINTER OR REPEATER WITH LINE RELAYS:
   A. REMOVE STRAP CONNECTING AN-1 TO AN-2.
   B. CONNECT LINE SIDE OF LINE RELAY COIL TO AN-1 OR C-17.
   C. CONNECT LINE SIDE OF LINE RELAY COIL TO AN-2 OR C-32.
   D. TO RECEIVE ON AUXILIARY UNIT ONLY AFTER CONFIRMATION HAS BEEN RECEIVED BY THE RECEIVING SET, CONNECT OC-4 AND OC-5 OR C-13 AND C-14 ACROSS THE AUXILIARY LINE RELAY CONTACTS.
   E. AUXILIARY LOOP BATTERY, BUS WIRING, MOUNTING FACILITIES, ETC. MUST BE PROVIDED BY THE CUSTOMER AND ARE NOT SHOWN.

5. CIRCUITS SHOWN FOR 286 AMP NEUTRAL SIGNAL LINE OPERATION. FOR 220 AMP OPERATION REMOVE CONNECTION BETWEEN TERMINALS 1 AND 2 AND ADD CONNECTION BETWEEN TERMINALS 1 AND 6 ON THE LINE RELAY TERMINAL BLOCK.

6. WHEN LESU IS USED IN 28LA APP CAB.

7. WHEN LESU IS USED IN 28LB APP CAB.

Figure 20 - 28LD and 28LD-1 Electrical Service Units
Figure 21 - 28M Electrical Service Unit
ISS 1, SECTION 573-133-400

Figure 26 - Z66H Electrical Service Unit

NOTES:
1. CIRCUITS SHOWN FOR 0.6 AMP NEUTRAL SIGNAL LINE OPERATION. FOR 0.2 AMP OPERATION REMOVE AND ADD CONNECTIONS AS FOLLOWS:

<table>
<thead>
<tr>
<th>SIGNAL LINE CURRENT</th>
<th>CONNECTION REMOVED</th>
<th>CONNECTION ADDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 AMP</td>
<td>A1-A2</td>
<td>A1-A2</td>
</tr>
</tbody>
</table>

2. THE SPARE LEADS FROM THE KEYBOARD AND TYPING UNIT CONNECTORS ARE TERMINATED IN THE RIGHT AND LEFT ENDS OF THE ELECTRICAL SERVICE UNIT RESPECTIVELY.

3. STRAP TERMINALS CJ TO CJ TO DISABLE LINE BREAK SWITCH.

4. X SPlice.

5. THE 28R ELECTRICAL SERVICE UNIT IS FOR USE WITH 48 VOLT DC TELETYPERS.

6. IF 600 OHM RESISTOR IS PRESENT, STRAP AS INDICATED.

ADDITIONAL NOTES:
- SEE NOTE 2:
- SEE NOTE 3:
- SEE NOTE 6:
- SEE NOTE 1:

ELECTRICAL SERVICE UNIT GROUND SCREW

TERMINAL BLOCK

- STRAP TERMINALS CJ TO CJ TO DISABLE LINE BREAK SWITCH.
- X SPlice.
- THE 28R ELECTRICAL SERVICE UNIT IS FOR USE WITH 48 VOLT DC TELETYPERS.
- IF 600 OHM RESISTOR IS PRESENT, STRAP AS INDICATED.
NOTES:
1. CIRCUITS SHOWN FOR 0.060 AMP NEUTRAL SIGNAL LINE OPERATION. FOR 0.020 AMP OPERATION REMOVE AND ADD CONNECTIONS AS
   FOLLOWS:
   SIGNAL LINE
   CONNECTION
   CURRENT
   REMOVED
   ADDED

   AI - A2 0.020 0.020
   AI - A4, A2 - A3
   (PLACE TWO STRAPS IN
   PARALLEL)

2. THE SPARE LEADS FROM THE KEYBOARD AND TYPING UNIT CONNECTORS ARE TERMINATED IN THE RIGHT AND LEFT ENDS
   OF THE ELECTRICAL SERVICE UNIT RESPECTIVELY.

3. STRAP TERMINALS C10 TO C11 TO DISABLE LINE BREAK
   SWITCH.

Figure 27 - 285 Electrical Service Unit
3. 28 ELECTRICAL SERVICE UNIT SUBASSEMBLY WIRING DIAGRAMS

![Diagram of TP152950 Rectifier Assembly](image)

Figure 29 - TP152950 Rectifier Assembly
(120 Mil Output)
Figure 30 - TP153251 Electrical Motor Control Assembly
Figure 31 - TP152623 Line Relay Mounting Assembly
AUXILIARY CONTACTS

TEST

W-BK

W

P

R

BK

BL

W-G

S

O

G

TP153476 CABLE ASSEMBLY

SIGNAL LINE CONTACTS

TEST

BR

BARE WIRE STRAP 39522 RM (2 PLS)

ADD TP151819 STRAP FOR .060 AMP OPERATION. REMOVE STRAP FOR .020 AMP OPERATION.

Figure 32 - TP152625 Line-Test Key Assembly
Figure 33 - TP152624 Capacitor Resistor Assembly