

**TERMINATING AND B SENDER  
 MULTIPLE REARRANGEMENT**

**CONTENTS**

- 1. GENERAL
- 2. PLANNING WORK SHEETS
- 3. PRELIMINARY WORK
- 4. TRANSITION WORK
- 5. CLEAN-UP WORK

**1. GENERAL**

1.1 This section outlines the work associated with the addition of senders to and the rearrangement of the terminating and B sender multiple on the terminating sender link frames.

1.2 A typical transition has been selected so as to show all of the conditions usually found. Since each job varies and may not involve all the problems outlined herein, this typical case should be used only as a guide.

1.3 Figure 1 lists the items that apply to terminating and B sender multiple transition and their locations.

1.31 These items may not all apply on each job but they should be checked for possible application.

Items Associated With The  
 TERM. & B SDR. MULT. Transition

Location	Item
TSL Frame	Terminal Strip & Secondary Switch
TSL Frame	LL Relay Chain
TSL Frame	Frame Indication Leads
TERM SEND FR	Frame Indication Cables

FIGURE 1  
 (PAR. 1.3)

**2. PLANNING WORK SHEETS**

2.1 Work sheet ID-487, a sample of which is shown on Figure 3, is furnished for term. sender multiple.

2.2 The method of correctly using the furnished work sheet is similar to that described in Section 26, Paragraph 2 of this handbook.

2.3 Figure 2 shows the multiple portion of a completed ID-487 work sheet.

2.31 This figure was compiled by using the wiring list (T(JOB BASE NO)-5900N) for existing terminating sender link frames and reproducing the sketch shown for the sender multiple at the secondary switches on the work sheet. Next, the wiring list (T (JOB BASE NO)-5900) for the added portion of the job was referred to and the sender multiple at the secondary switches was added to the work sheet. This figure now shows both the old and the new sender multiple wiring.

2.4 Figure 8 is an illustration of the frame indication multiple on the term. senders and term. sender link.

2.41 It is recommended that a work sheet similar to that shown in Figure 8 be made up on the job.

**3. PRELIMINARY WORK**

3.1 This work consists of erecting the new terminating sender link frames cabling and connecting of cables, local forms and straps at all points except at the working circuit end. All work required to make the additional senders available for transition purposes should be completed before the sender multiple transition starts. In some cases, these operations may overlap but overlapping is not advisable.

**4. TRANSITION WORK**

**4.1 General**

4.11 This procedure, consisting of four steps, outlines the rearrangement of a terminating and B sender multiple consisting of three sender subgroups throughout six TSL frames so as to become a sender multiple consisting of four sender subgroups through out eight TSL frames. These multiples are shown in Figures 4, 5, 6 and 7.

**4.2 Objective**

4.21 The first objective is the establishment in the sender multiple of new subgroup 3, which requires the use of 3 switch appearances that are now assigned to subgroup 0, two switch appearances that are now assigned to subgroup 1 and one new switch appearance on new TSL frame 7. This procedure, consisting of four steps provides for the establishment of new sender subgroup 3 and the rearrangement of present sender subgroups 0, 1 and 2.

**4.3 Step 1 - Establish New Sender Subgroup 3 Refer to Figure 4**

4.301 Make busy sender subgroup 0.

4.302 Block operated the GB relays associated with the following secondary switches.

TSL Frame	Sec. Sw.
3	0
4	1
5	3

4.303 Disconnect the cable between secondary switch and terminal strip No. 2 on TSL frame 2 and secondary switch and terminal strip No. 0 on TSL frame 3.

4.304 Establish a temporary "last appearance" of the LL relay chain for sender subgroup 0, as secondary switch 2 on TSL frame 2 as follows:

Disconnect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
2	2	0	AND	3	0	1
2	2	3	AND	3	0	4

Connect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
2	2	2 and 3

4.305 Disconnect the present frame indication cable at secondary switch and terminal strip 2 on TSL frame 5 and also at the last present sender frame on which sender subgroup 0 now appears. Refer to Figure 7.

4.306 Connect the new frame indication cable for present sender subgroup 0, at the last present sender frame on which present sender subgroup 0 now appears.

4.307 Test, and remove the busy condition from sender subgroup 0.

4.308 Connect the new cable between secondary switch and terminal strip 2 on TSL frame 5 and secondary switch and terminal strip 0 on TSL frame 7.

4.309 Remove the present last appearance of the LL relay chain for sender subgroup 0 as follows:

Disconnect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	2	2 and 3

Connect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	2	0	AND	7	0	1
5	2	3	AND	7	0	4

4.310 Make busy sender subgroup 2. Refer to Figure 5.

4.311 Block operated, the GB relays associated with the following secondary switches.

TSL FR	SEC. SW.
0	1
1	2

4.312 Disconnect the cable between secondary switch and terminal strip 2 on TSL frame 1 and secondary switch and terminal strip 0 on TSL frame 2.

4.313 Establish a temporary first appearance of the LL relay chain for sender subgroup 2 as follows:

Disconnect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
1	2	0	AND	2	0	1
1	2	3	AND	2	0	4

Connect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
2	0	1 and 2.

4.314 Disconnect the frame indication cable for present sender subgroup 2 at the first sender frame on which it appears, and reconnect it for new sender subgroup 3 at the first sender frame on which subgroup 3 will appear.

4.315 Test and remove the busy condition from sender subgroup 2.

4.316 Connect the new cable between secondary switch and terminal strip 2 on TSL frame 1 and secondary switch and terminal strip 0 on TSL frame 3.

4.317 Connect the new sender cable for new subgroup 3 at secondary switch and terminal strip 0 on TSL frame 3.

4.318 Test and place new sender subgroup 3 into service by removing the blocks from the GB relays associated with the following secondary switches.

TSL FR.	SEC.SW.
0	1
1	2
3	0
4	1
5	2

→ 4.4 Step-2 - Re-establish Sender Subgroup  
Refer to Figure 5

4.401 Make busy sender subgroup 1.

4.402 Block operated, the GB relays associated with the following secondary switches:

TSL FR.	SEC.SW.
4	0
5	1

4.403 Disconnect the cable between secondary switch and terminal strip 2 on TSL frame 3 and secondary switch and terminal strip 0 on TSL frame 4.

4.404 Establish a temporary last appearance of the LL relay chain for sender subgroup 1 at secondary switch 2 on TSL frame 3 as follows:

Disconnect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
3	2	0	AND	4	0	1
3	2	3	AND	4	0	4

Connect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
3	2	2 and 3

4.405 Disconnect the present frame indication cables at secondary switch and terminal strip 1 on TSL frame 5 and also at the last present sender frame on which sender subgroup 1 now appears.

4.406 Connect the new frame indication cable for present sender subgroup 1 at the last present sender frame on which sender subgroup 1 now appears.

4.407 Test and remove the busy condition from sender subgroup 1.

4.408 Made busy sender subgroup 0.

4.409 Remove the temporary last appearance of the LL relay chain for sender subgroup 0, as follows:

Disconnect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
2	2	2 and 3

Connect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
2	2	0	AND	3	0	1
2	2	3	AND	3	0	4

4.410 Remove the present last appearance of the LL relay chain for sender subgroup 1 as follows:

Disconnect Straps Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	1	2 and 3

Connect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	1	0	AND	6	2	1
5	1	3	AND	6	2	4

4.411 Connect the cable between secondary switch and terminal strip 2 on TSL frame 2 and secondary switch and terminal strip 0 in TSL frame 4.

4.412 Connect the cable between secondary switch and terminal strip 1 on TSL frame 5 and secondary switch and terminal strip 2 on TSL frame 6.

4.413 Remove the blocks from the GB relays associated with the following secondary switches:

TSL FR.	SEC.SW.
4	0
5	1

4.414 Test and remove the busy condition from sender subgroup 0.

4.5 Step 3 - Re-establish Sender Subgroup 2 Refer to Figure 6

4.501 Make busy sender subgroup 1.

4.502 Block operated the GB relay associated with the following secondary switch:

TSL FR.	SEC.SW.
0	2

4.503 Disconnect the cable between secondary switch and terminal strip 2 on TSL frame 0 and secondary switch and terminal strip 0 on TSL frame 1.

4.504 Establish a new first appearance of the LL relay chain for sender subgroup 1 secondary switch 0 on TSL frame 1 as follows:

TSL FR	SEC.SW. TERM.STRIP	PCHG.	AND	TSL FR	SEC.SW. TERM.STRIP	PCHG.
0	2	0	AND	1	0	1
0	2	3	AND	1	0	4

Connect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
1	0	1 and 2

4.505 Disconnect the frame indication cable for present sender subgroup 1 at the first sender frame on which it appears, and reconnect it for use by present sender subgroup 2, at the first sender frame on which subgroup 2 will appear.

4.506 Connect the new frame indication cable for present subgroup 1, at the first sender frame on which subgroup 1 will appear, and also at TSL frame 1, secondary switch and terminal strip 0.

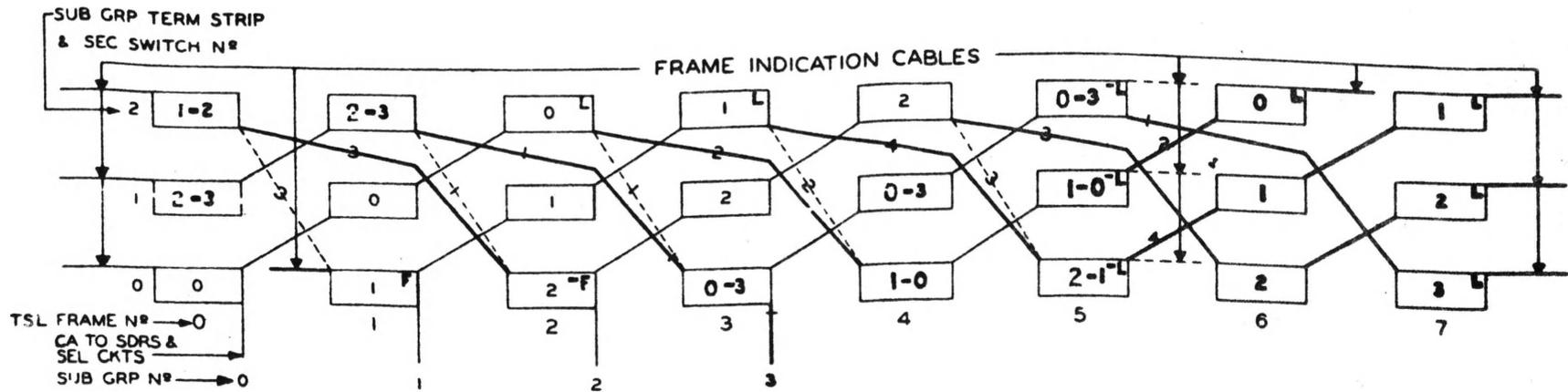
4.507 Test and remove the busy condition from sender subgroup 1.

4.508 Make busy sender subgroup 2.

4.509 Disconnect the cable between secondary switch and terminal strip 2 on TSL frame 4 and secondary switch and terminal strip 0 on TSL frame 5.

4.510 Connect the cable between secondary switch and terminal strip 2 on TSL frame 0 and secondary switch and terminal strip 0 on TSL frame 2.

4.511 Connect the cable between secondary switch and terminal strip 2 on TSL frame 4 and secondary switch and terminal strip 0 on TSL frame 6.



NUMBERS SHOWN IN LL CHAIN SKETCH REPRESENT PUNCHINGS ON 216 ATS. ON SEC. SW. SHOW ON T25028-17.

NUMBERS SHOWN ON CABLES BETWEEN SECONDARY SWITCHES IN CHARTS INDICATE THE ORDER IN WHICH CABLES ARE WORKED ON. LIKE NUMBERS BEING WORKED ON SIMULTANEOUSLY.

----- REMOVE  
 \_\_\_\_\_ INSTALL  
 —●— REMAIN AS IS

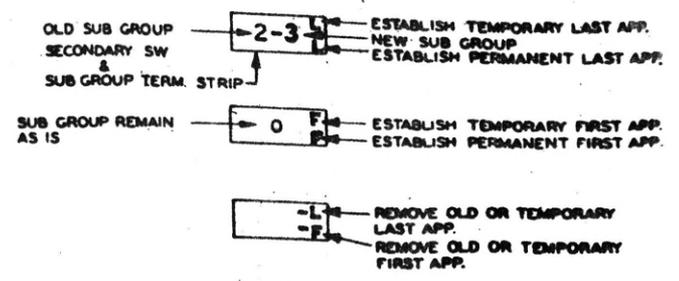
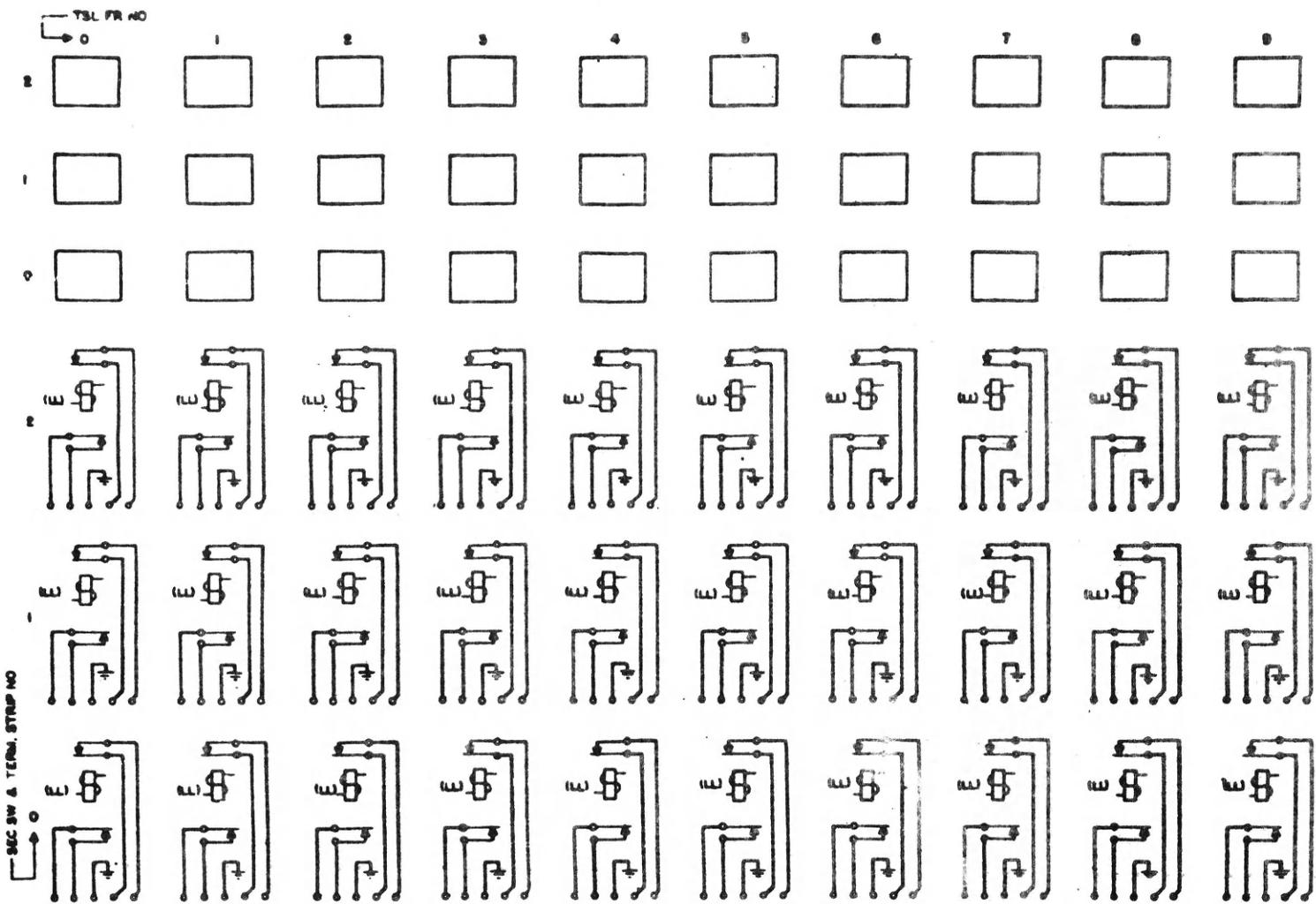


FIG. 2 TYPICAL COMPOSITE ARRANGEMENT OF OLD AND NEW TERMINATING AND B SENDER MULTIPLE AT SECONDARY SWITCHES ON THE TSL FRAMES (PAR 2.3)

10-487 (7-54)



NOTE

WHEN TRANSITION INVOLVES SENDER LINKS PER SD-25028-C1, THE LL RELAY TERMS COUNT FROM RIGHT TO LEFT AND ARE NUMBERED 0 TO 4. OTHERWISE SD-25459-01 IS APPLIED AND LL RELAY TERMINALS ARE NUMBERED 20 TO 24 IN THE SAME ORDER.

FIG. 3 WORK SHEET FOR TERM. AND B SNED. MULT. AND LL RELAY CHAIN WIRING (PAR 2.1)

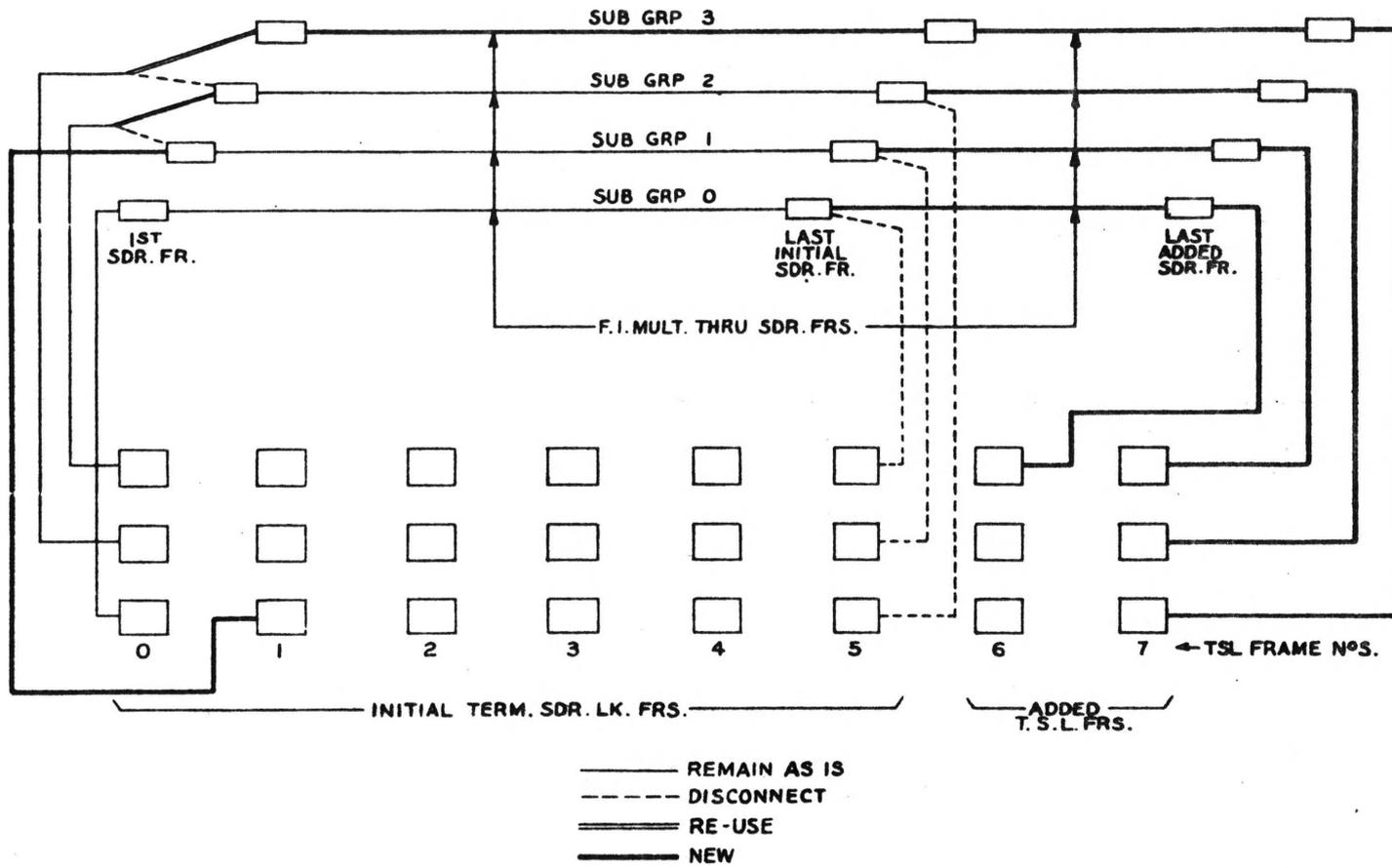


FIG. 8 TYPICAL ARRANGEMENT FOR FRAME INDICATION LEADS AT THE TSL FRAMES (PAR 2.4)

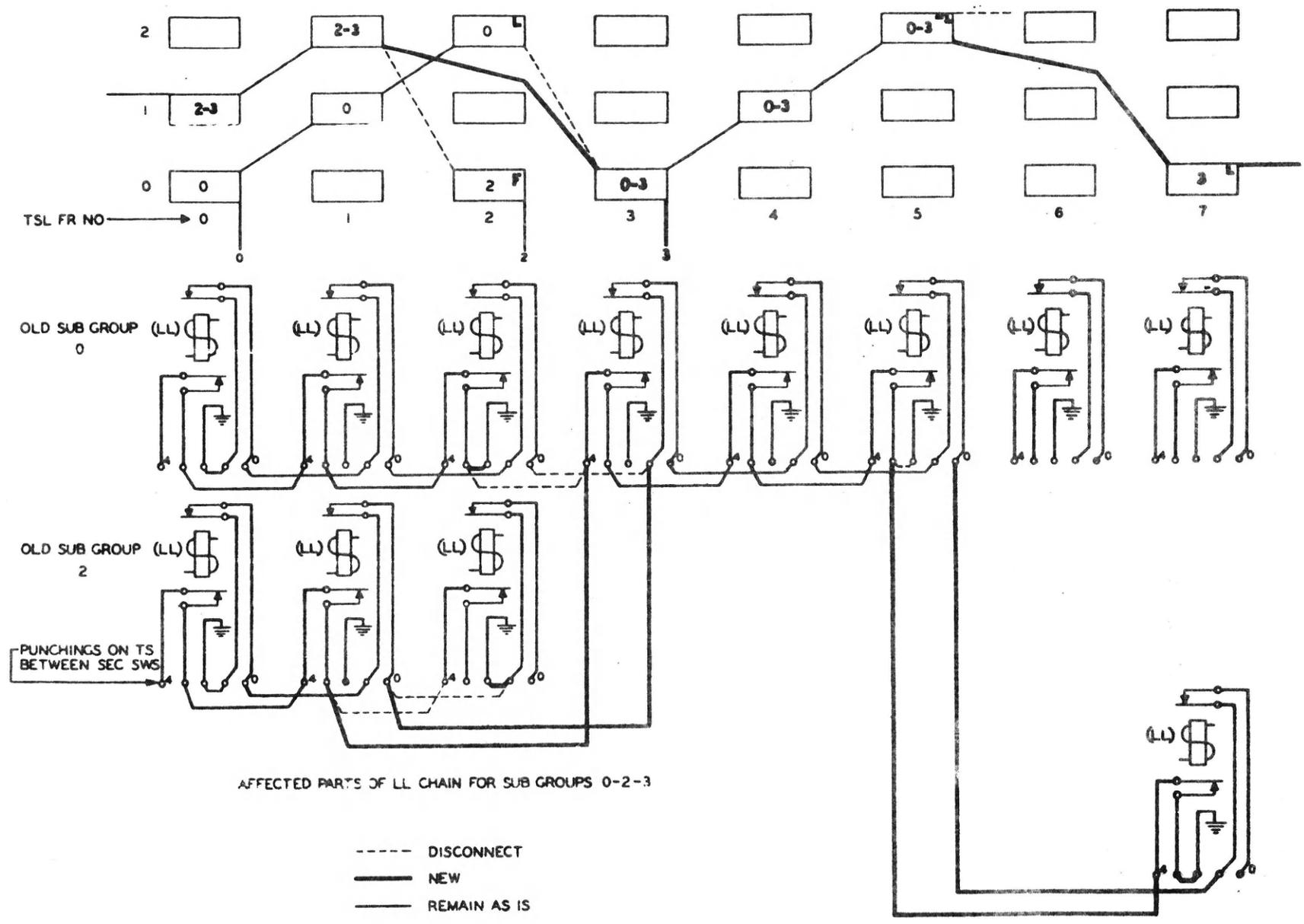


FIG. 4 ESTABLISH NEW SENDER SUBGROUP 3 (PAR 4.3)

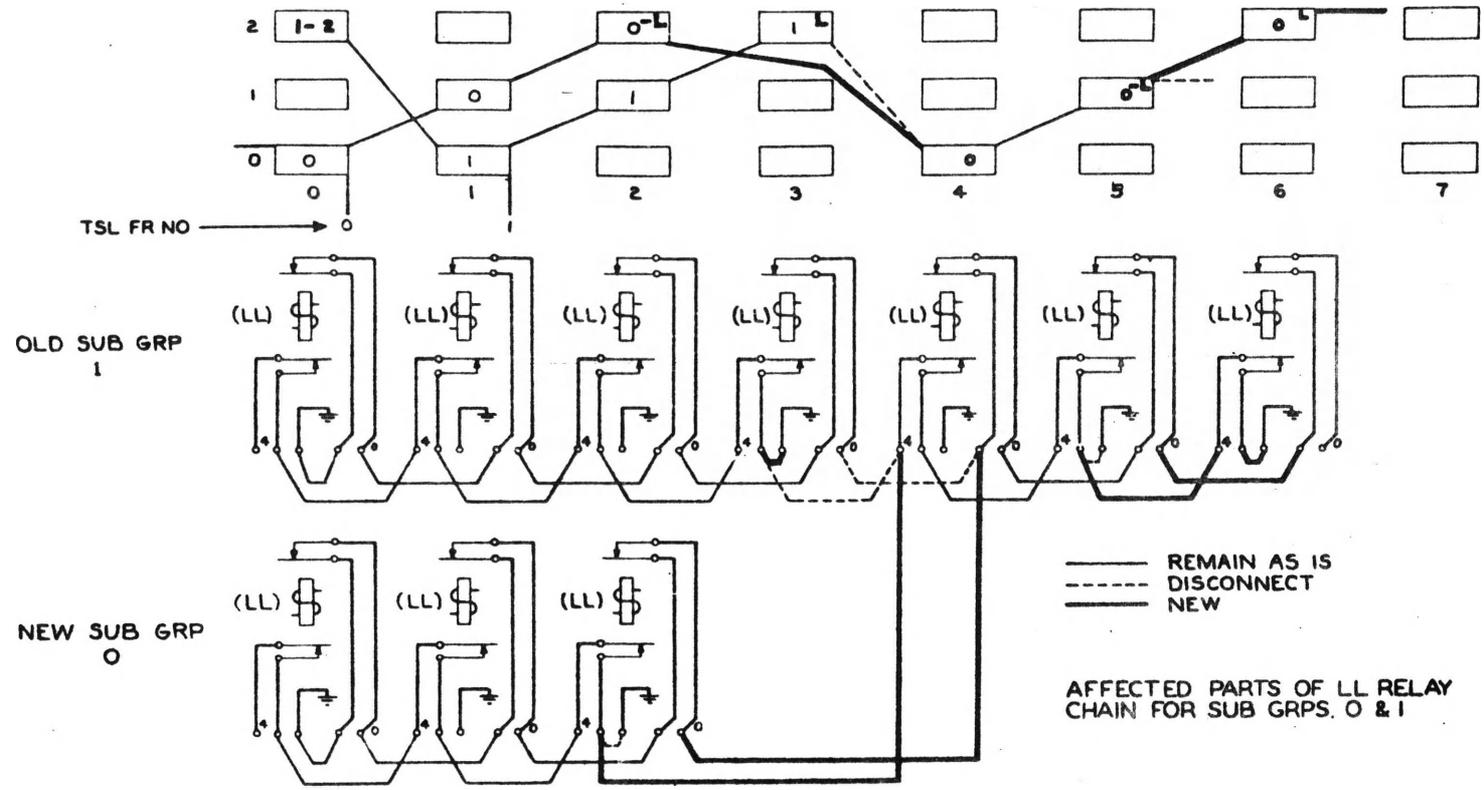


FIG. 5 RE-ESTABLISH SENDER SUBGROUP 0  
(PAR 4.4)



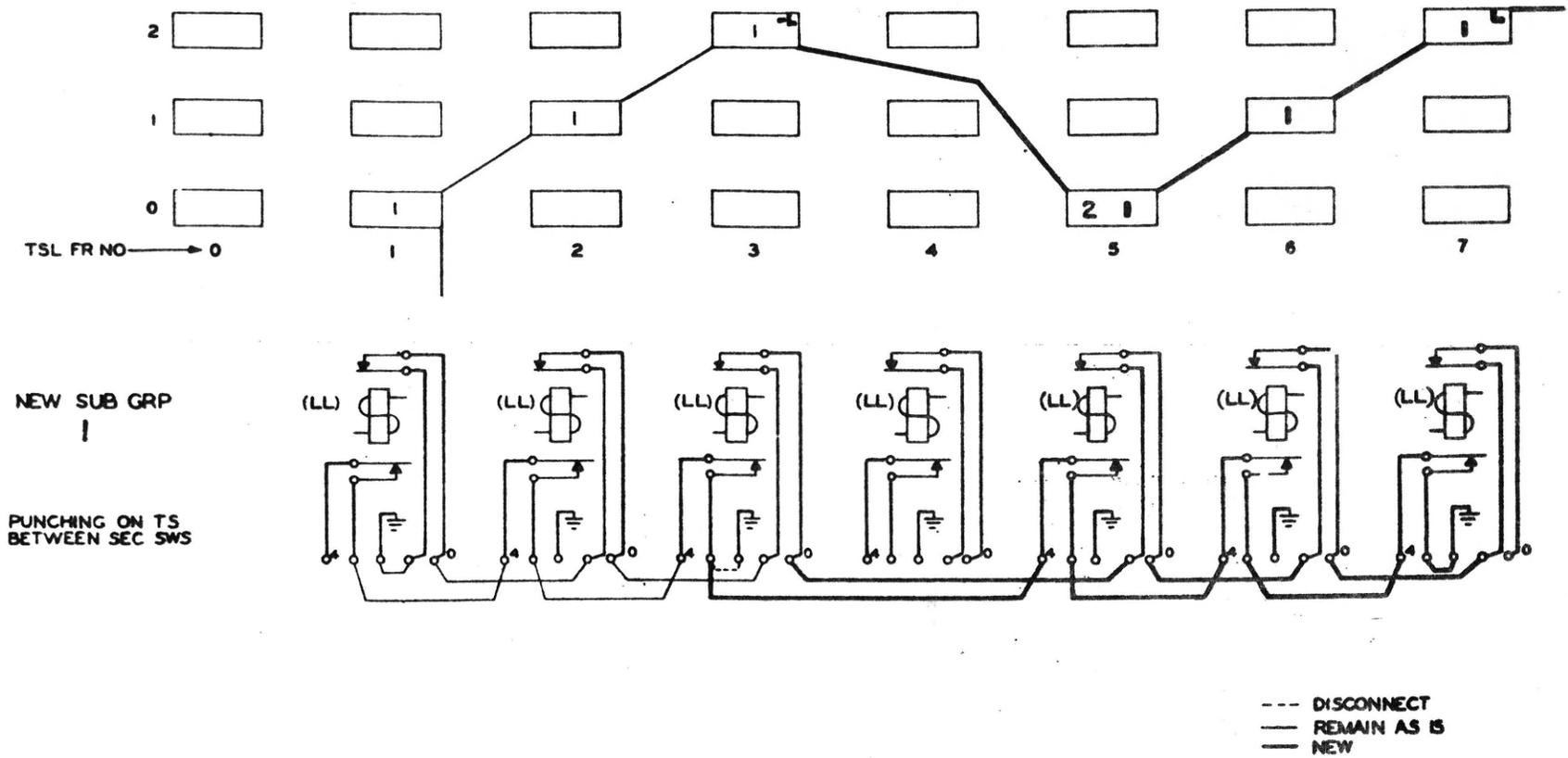


FIG. 7 RE-ESTABLISH SENDER SUBGROUP I  
(PAR 4.6)

4.512 Remove the present last appearance of the LL relay chain for sender subgroup 2 at secondary switch and terminal strip 0 on TSL frame 5 as follows:

Disconnect Strap Between Punchings

TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	0	2 and 3

Connect Cable Between

TSL FR	SEC.SW. TERM.STRIP	PCHG.	TSL FR	SEC.SW. TERM.STRIP	PCHG.
5	0	0	AND 6	1	1
5	0	3	AND 6	1	4

4.513 Disconnect the present frame indication cable at secondary switch and terminal strip 0 on TSL frame 5 and also at the last present sender frame on which sender subgroup 2 now appears. Refer to Figure 6.

4.514 Connect the new frame indication cable for sender subgroup 2 at the last present sender frame on which sender subgroup 2 now appears.

4.515 Remove the block from the GB relay associated with the following secondary switch:

TSL FR.	SEC.SW.
0	2

4.516 Test and remove the busy condition from sender subgroup 2.

→ Arrowed lines indicate new or changed information.

4.6 Step 4 - Re-establish Sender Subgroup 1 Refer to Figure 7

4.61 Make busy sender subgroup 1.

4.62 Connect the cable between secondary switch and terminal strip 2 on TSL frame 3 and secondary switch and terminal strip 0 on TSL frame 5.

4.63 Connect the cable between secondary switch and terminal strip 0 on TSL frame 5 and secondary switch and terminal strip 1 on TSL frame 6.

4.64 Remove the temporary last appearance of the LL relay chain for sender subgroup 1 at secondary switch 2 on TSL frame 3 as follows:

Disconnect Strap Between Punching

TSL FR.	SEC.SW. TERM.STRIP	PCHG.
3	2	2 and 3

Connect Cable Between.

TSL FR	SEC.SW TERM.STRIP	PCHG.	TSL FR	SEC.SW TERM.STRIP	PCHG.
3	2	0	AND 4	0	1
3	2	3	AND 4	0	4

4.65 Test and remove the busy condition from sender subgroup 1.

6. CLEAN-UP WORK

6.1 Remove all wiring and cabling, no longer required, as specified.

Engineer of Installation

Reason for Reissue:  
Complete handbook revision.

Replaces Section 46 dated 2-20-47.