

**SUBSCRIBER AND TANDEM SENDER MULTIPLE CHANGES**

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**1. GENERAL**

1.1 This section outlines the work associated with the rearrangement of the sender multiple on the sender link frames in tandem and No. 1 crossbar offices.

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 as a guide.

1.3 Figure 1 lists the items that apply to subscriber sender multiple transition and their location.

Items Associated With The  
 SDR. MULT. Transition

Location	Item
SDR. LINK FR	Secondary Switches
"	C Relay
"	LL Chain
"	GS, GT, RT, Leads
"	Frame Indication Leads

FIGURE 1 (Par. 1.3)

**2. PLANNING WORK SHEETS**

**2.1 Secondary Switch Work Sheets**

2.11 Whenever a new group of senders or a sender link frame is added to an office, the sender link multiple will be rearranged to accommodate the new equipment. The following explanation pertains to subscriber sender link multiple, however it is a typical case and can be used as a guide for tandem sender link multiple re-arrangement. When rearranging sender link multiple in tandem offices, per SD-25353-01 use work sheet SD-4-484-A.

2.12 Using wiring list, T XXXX-5840, copy the secondary switch multiple arrangement on work sheet ID-482, (shown as Figure 3).

2.13 On large modifications, a sender link wiring list to show the existing multiple will be furnished. This drawing has the same number as the drawing mentioned in the preceding paragraph except that the letter N is added after the last digit. By comparing the existing multiple arrangement with the future arrangement now shown on the work sheet, it can be determined which cables are to be removed or added. With the appropriate symbols or colors i.e. red-new; blue-disconnect; black-no change; this information can be added to the work sheet.

2.14 On small multiple modifications the "N" drawing will not be furnished. However, the details will be provided in the sender link frame specification.

2.15 The work sheet will now show a composite arrangement of existing and future multiple. It should be similar to Figure 2. If more than 10 sender link frames are involved, the work sheets can be glued together and cut as required. It will be noted in Figure 2 that one work sheet per sender link frame group will be sufficient to clearly show the multiple arrangement.

**2.2 C and LL Relay Work Sheets**

2.21 Using a method similar to the that described in Paragraphs 2.12 to 2.15, work sheet ID-483, (shown as Figure 5) for the C relays and LL chains can be prepared.

2.22 In offices where the C relay multiple is identical to the secondary switch multiple, the C relay multiple will not be shown on the wiring list. In these cases, the changes in the C relay multiple can be obtained from work sheet ID-402 previously prepared.

2.23 One work sheet should be used for each subgroup of senders and if more than 10 appearances are required, the work sheets may be glued and cut as needed.

2.24 Figure 4A is a typical example of a completed ID-483 work sheet. The LL relays have punchings provided for SD-25004-01 or SD-25554-01. The cabling of the secondary switch multiple is not always in order of the appearance number specified. In these cases, the LL relay chain cable would bypass one or more appearances in order to connect the chain as specified in the wiring list. Extra punchings are provided for this condition on the work sheets and are also indicated in the example shown in Figure 4A.

**2.3 Frame Indication Changes**

2.31 Figure 6 shows a typical arrangement for the frame identification cross connection terminal strips that are located on the top of each sender link frame.

SUBS SDR MULT SEC SWS

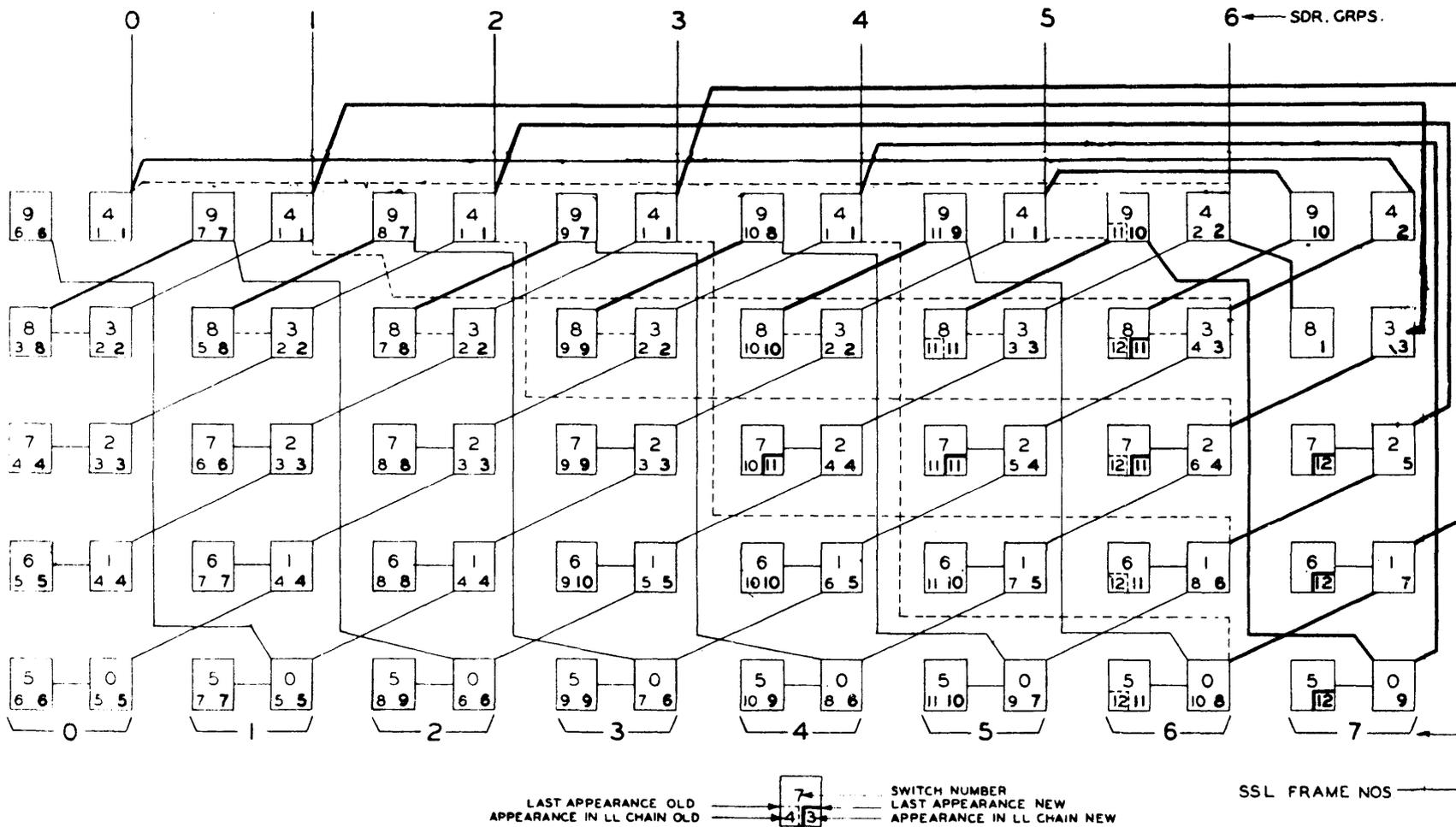
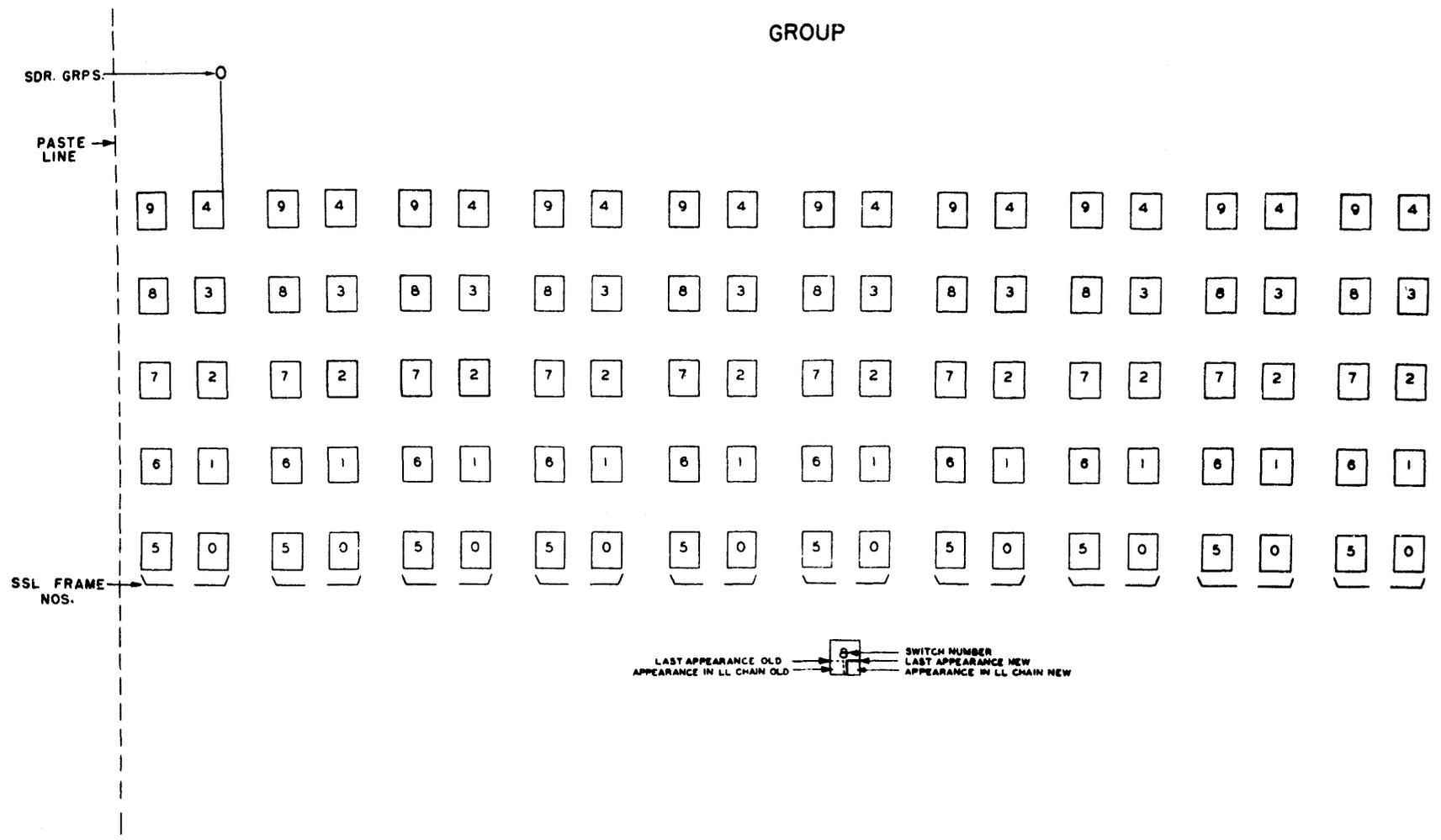


FIG. 2 TYPICAL COMPOSITE ARRANGEMENT OF OLD AND NEW SUBSCRIBER SENDER MULTIPLE AT SECONDARY SWITCHES ON THE SSL FRAMES (Par. 2.15)



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FIG. 3 WORK SHEET FOR SUBS. SDR. MULT. ON SSL FRAME SEC SWS (Par. 2.12)

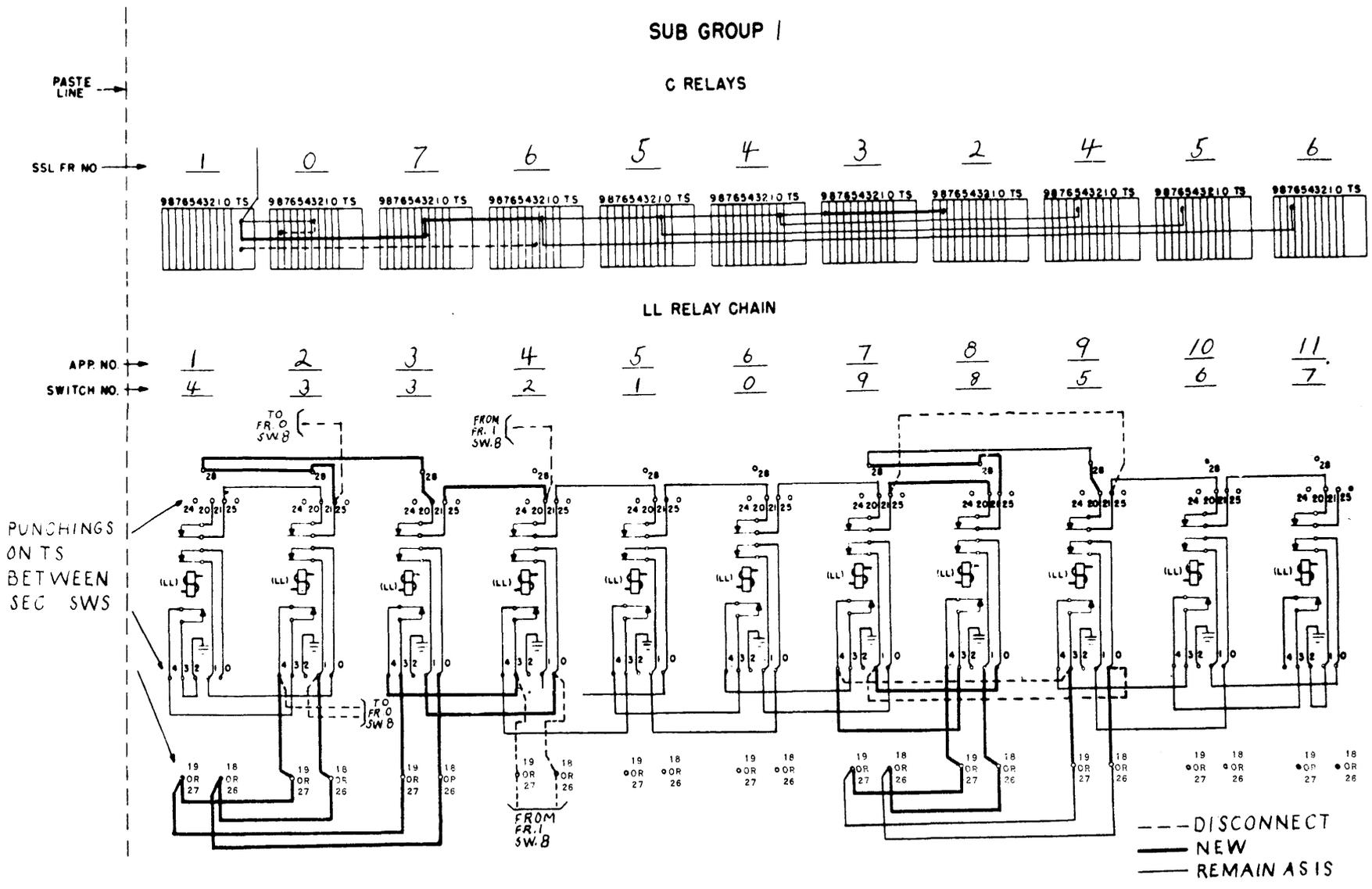
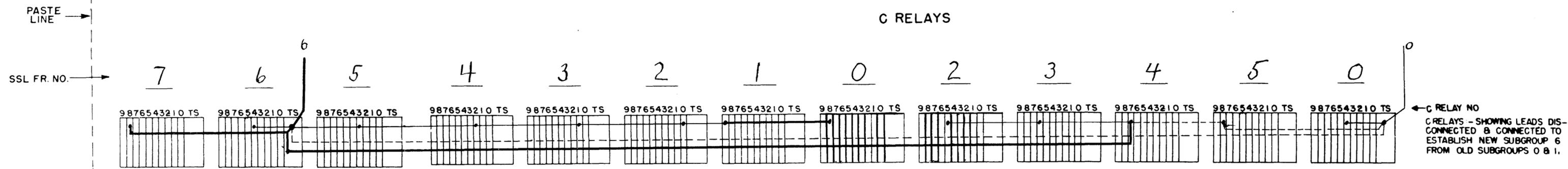


FIG. 4A TYPICAL COMPOSITE ARRANGEMENT OF OLD AND NEW SUBSCRIBER SENDER MULTIPLE AT THE "C" RELAYS AND LL CHAIN ON THE SSL FRAMES (Par. 2.24)

### SUB GROUP 6+0

#### C RELAYS



#### LL RELAY CHAIN

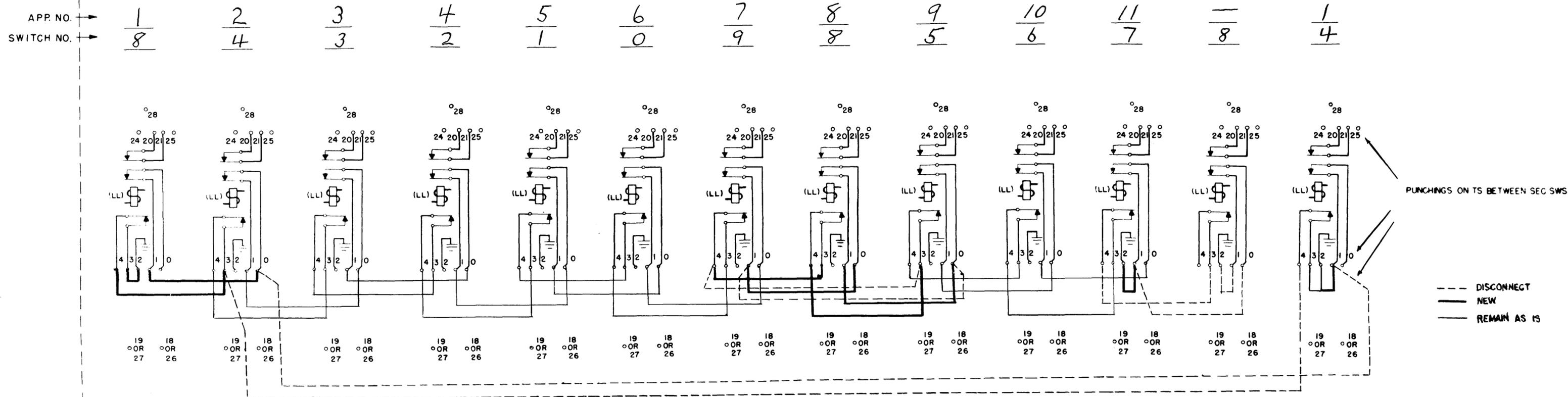
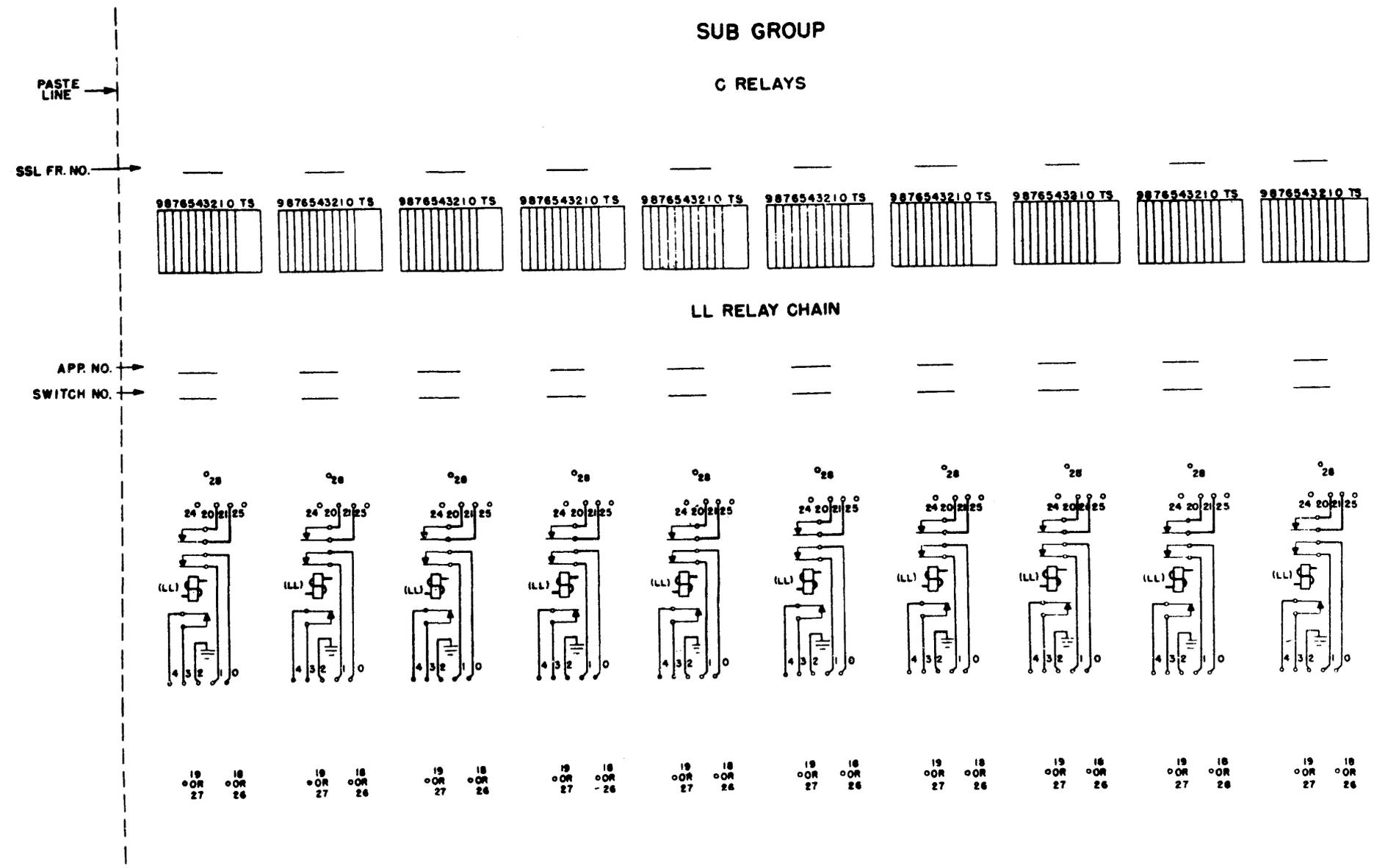
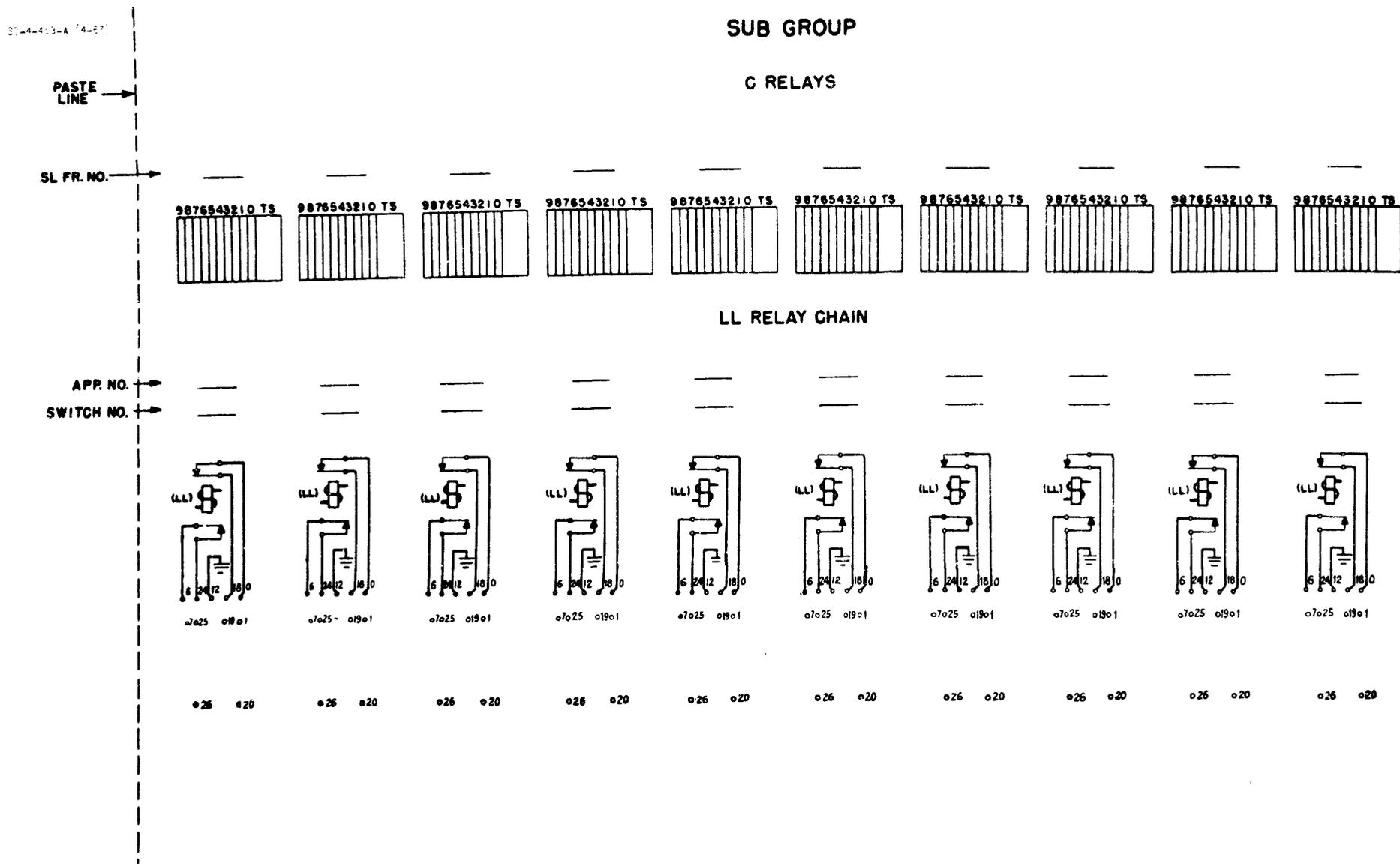


FIG. 4 TYPICAL COMPOSITE ARRANGEMENT OF OLD AND NEW SUBS. SDR. MULTIPLE AT THE "C" RELAYS ON THE SSL FRAMES ALSO TYPICAL OLD AND NEW LL RELAY CHAIN ARRANGEMENT FOR SD-25004-01 ONLY



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FIG. 5 WORK SHEET FOR C RELAY AND LL RELAY CHAIN WIRING ON THE SSL FRAMES (Par. 2.21)



→ FIG. 7 WORK SHEET FOR C RELAY AND LL CHAIN TANDEM SENDER LINK (PAR. 2.11)

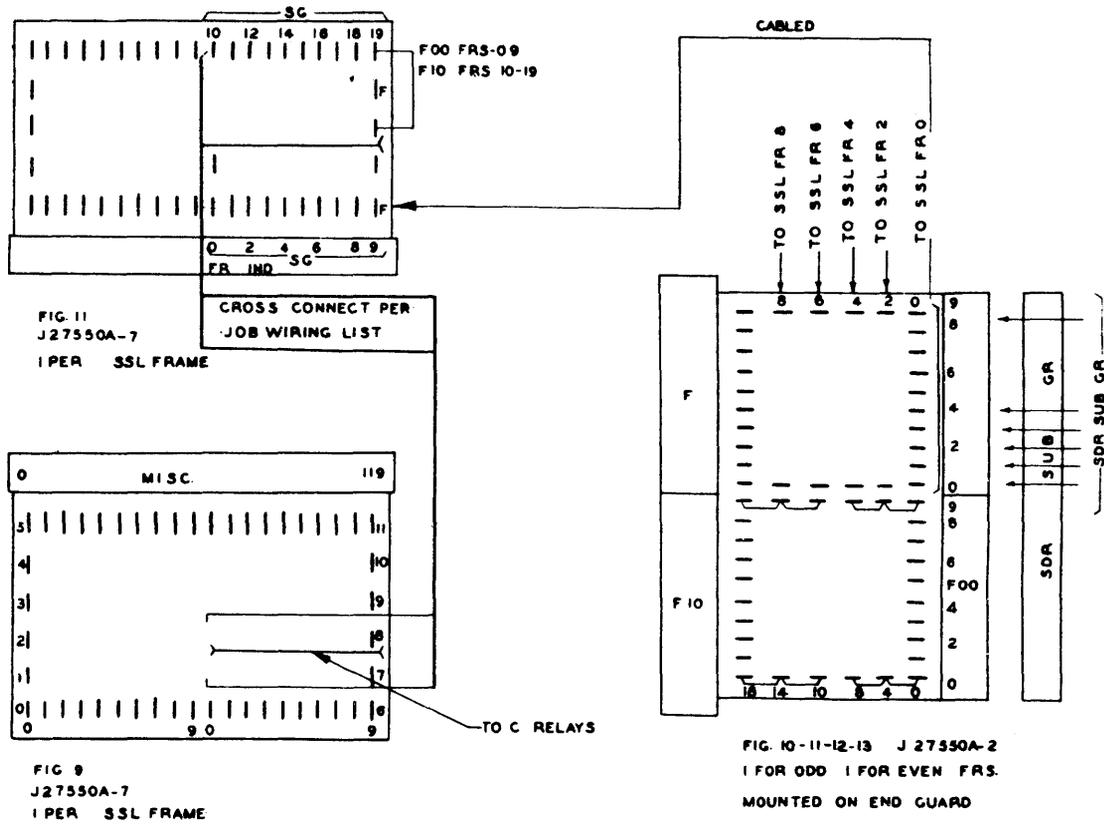


FIG. 6 TYPICAL ARRANGEMENT FOR FRAME INDICATION LEADS AT THE SSL FRAME (Par. 2.31)

2.32 Two cross connections per C relay are required. Punchings 70 to 79 and 80 to 89 are the C relay terminals on the MISC. terminal strip. The unit digit of the terminal number corresponds to the C relay number and secondary switch number on the sender link frame.

2.33 The FR IND terminal strip, located above the MISC terminal strip has an F terminal and an F00 or F10 terminal for a maximum of 20 sender subgroups. The F00 terminals are shown on sender link frames 0-9 and the F10 terminals on sender link frames 10-19.

2.34 The C relay terminals and the SG terminals are to be connected so that the correct numbered subgroup of senders is cross connected to the C relay punchings on which the subgroup appears on the link frame.

**EXAMPLE:** If subgroup 4 appears on switch 2, the common leads for subgroup 4 would appear on C2 relay. The C2 relay punchings on the MISC terminal strip is 72 and 82. These terminals should be connected to SG terminal (F)4 and (F00)4 or (F10)4 respectively.

2.35 Included in the wiring list is a table showing the ultimate cross-connection information for the associated installation. There will be installations where the transition will require that a switch be temporarily assigned a subgroup. When this occurs, the frame indication cross connection also have to be temporarily installed.

2.36 The cross connection change information can be conveniently added to ID-483, LL and C relay work sheet. Space is available above the C relays for the addition of the 4 punching numbers required.

### 3. PRELIMINARY WORK

3.1 This work consists of erecting the new subscriber sender link frames, cabling and connecting of cables, local forms, as far as practical, 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 outlines in four steps the rearrangement of a subscriber sender multiple consisting of six sender subgroups throughout seven subscriber sender link frames, so as to become a sender multiple consisting of seven sender subgroups throughout eight subscriber sender link frames. The composite arrangement of the secondary switch multiple, C relay multiple and LL chains are shown in Figures 2 and 4.

#### 4.2 Objective

4.21 The first objective is the establishment of new subgroup 6 in the sender multiple, which requires the use of one switch appearance that is now assigned to subgroup 1 and a chain of switch appearances that are now assigned to subgroup 0. Refer to Figure 2. This procedure, consisting of four steps, provides only for the establishment of new subgroup 6. At the completion of this procedure, additional work of a similar nature will have to be performed on the present subgroups 0 to 5.

#### 4.3 Step 1

- (a) Make busy sender subgroup No. 1.
- (b) Block operated the GB relay that is associated with secondary switch No. 8 on SSL frame 0.
- (c) Disconnect the strapping from between secondary switches 3 and 8 on SSL frame 0.
- (d) Disconnect the local cable between C relays 3 and 8 on SSL frame 0.
- (e) Disconnect secondary switch 8 on SSL frame 0 from sender subgroup 1 LL relay chain circuit as follows:

#### Disconnect Leads At

FR	SW	TERM	NOTE
0	8	00 & 01	Splice the disconnected leads together.
0	8	03 & 04	Splice the disconnected leads together.

These terminals are located on the terminal strip at the bottom of secondary switch 8.

- (f) Test and remove the busy condition from sender subgroup 1.

#### 4.4 Step 2

- (a) Make busy sender subgroup 0.
- (b) Block operated the GB relays that are associated with the following secondary switches:

SSL Frames	Sec. Sw.
6	4
5	3 & 8
4	2 & 7
3	1 & 6
2	0 & 5
1	9

- (c) Disconnect the secondary switch cable from between SSL frame 0 secondary switch 4 and SSL frame 6 secondary switch 4.

- (d) Disconnect the strapping from between secondary switches 3 and 8 on SSL frame 5.

(e) Disconnect the cable from between the terminal strip of the C4 relay on SSL frame 0 and the terminal strip of the C4 relay on SSL frame 6.

(f) Disconnect the cable from between the terminal strip of the C4 relay on SSL frame 0 and the C8 relay on SSL frame 5.

(g) Disconnect the cable from between the C7 relay on SSL frame 4 and the C8 relay on SSL frame 5.

(h) Modify the LL relay chain for sender subgroup 0 as follows:

Disconnect Leads at

FR	SW	TERM	Strap Terminals
0	4	01,04,	01 to 02
1	9	01,04,	
2	5	00,03,	
4	7	01,04,	
5	8	00,01,02,03,	
6	4	00,03,	

(i) Test, and remove the busy condition from sender subgroup 0.

4.5 Step 3

- (a) Connect sender cable for new subgroup 6 at SSL frame 6 secondary switch 4.
- (b) Connect the secondary switch cable between SSL frame 6 secondary switch 4 and SSL frame 7 secondary switch 8.
- (c) Connect the secondary switch cables between SSL frame 0 secondary switch 8 and SSL frame 1 secondary switch 9.
- (d) Connect the cable for new subgroup 6 at the C4 relay terminal strip at SSL frame 6.
- (e) Connect the cable between the C4 relay terminal strip at SSL frame 6 and C7 relay at SSL frame 4.
- (f) Connect the cable between the C4 relay terminal strip at SSL frame 6 and C8 relay at SSL frame 7.
- (g) Connect the cable between the C8 relay at SSL frame 0 and the C9 relay at SSL frame 1.

(h) Connect the LL relay chain for new subgroup 6, between secondary switch as follows:

SSL FR	SW	PCHG		SSL FR	SW	PCHG
0	8	00	And	1	9	01
0	8	01	"	2	5	00
0	8	03	"	1	9	04
0	8	04	"	2	5	03
4	7	01	"	4	7	02
6	4	00	"	7	8	01
6	4	03	"	7	8	04
7	8	02	"	7	8	03

4.6 Step 4

(a) Rewire the frame indication leads for new subgroup 6 on all SSL frames as required. Compare the old and new wiring lists so as to determine the necessary wiring.

(b) Test, and place new sender subgroup 6 in service by removing the blocks from the GB relays associated with the following secondary switches.

SSL FR	SW
0	8
1	9
2	0 & 5
3	1 & 6
4	2 & 7
5	3
6	4

**NOTE:** Secondary switch 8 on SSL frame 5 will continue to have its GB relay blocked until sender subgroup 4 is rearranged in a later step.

(c) The preceding steps, 1 to 4, should be applied in a similar manner in the rearrangement of sender groups 0 to 5. It is recommended that the sender subgroup be rearranged in numerical sequence, starting with sender subgroup 0.

4.7 Sequence Chart

The following chart provides a condensed outline of the sequence of operations for the work of steps 1 to 4.

Operation	Sequence									
Release Sub. Grp. No. 1	-									
Disc. Strapping Between Switches	-									
Disc. Cable at C Relays	-									
Rewire LL relay Chain Ckt. - Subgroup No. 1	-									
Release Subgroup No. 0	-									
Disc. Cable Between Switches		-								
Disc. Strapping Between Switches		-								
Disc. Cable at C relays		-								
Rewire LL Relay Chain Ckt. - Subgroup 0 (partial)			-							
Rewire LL Relay Chain Ckt. - Subgroup 0 (partial)			-							
Establish New Subgroup 6				-						
Connect Cable Between Switches				-						
Connect Cable at C Relays				-						
Rewire LL relay Chain Ckt.					-					
Rewire Frame Indication Leads						-				

5. CLEAN UP WORK

5.1 This work includes the removal and disposition of wiring and cable no longer required, at the completion of the transition work.

➔ Arrowed lines indicate new or changed information.

Manager, Crossbar Product Engineering Control Center

Reason for Reissue:

- (1) Changes in Paragraph 2.11 and Fig. 7
- (2) Change ID-483-A to SD 4-483-A.

Replaces Section 26 dated 9-18-58.