

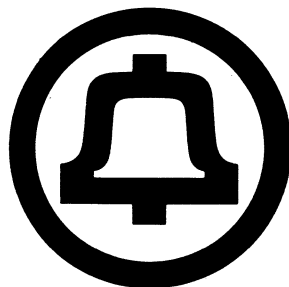
PTC NO. 320

# RELAY & APPARATUS ADJUSTMENT

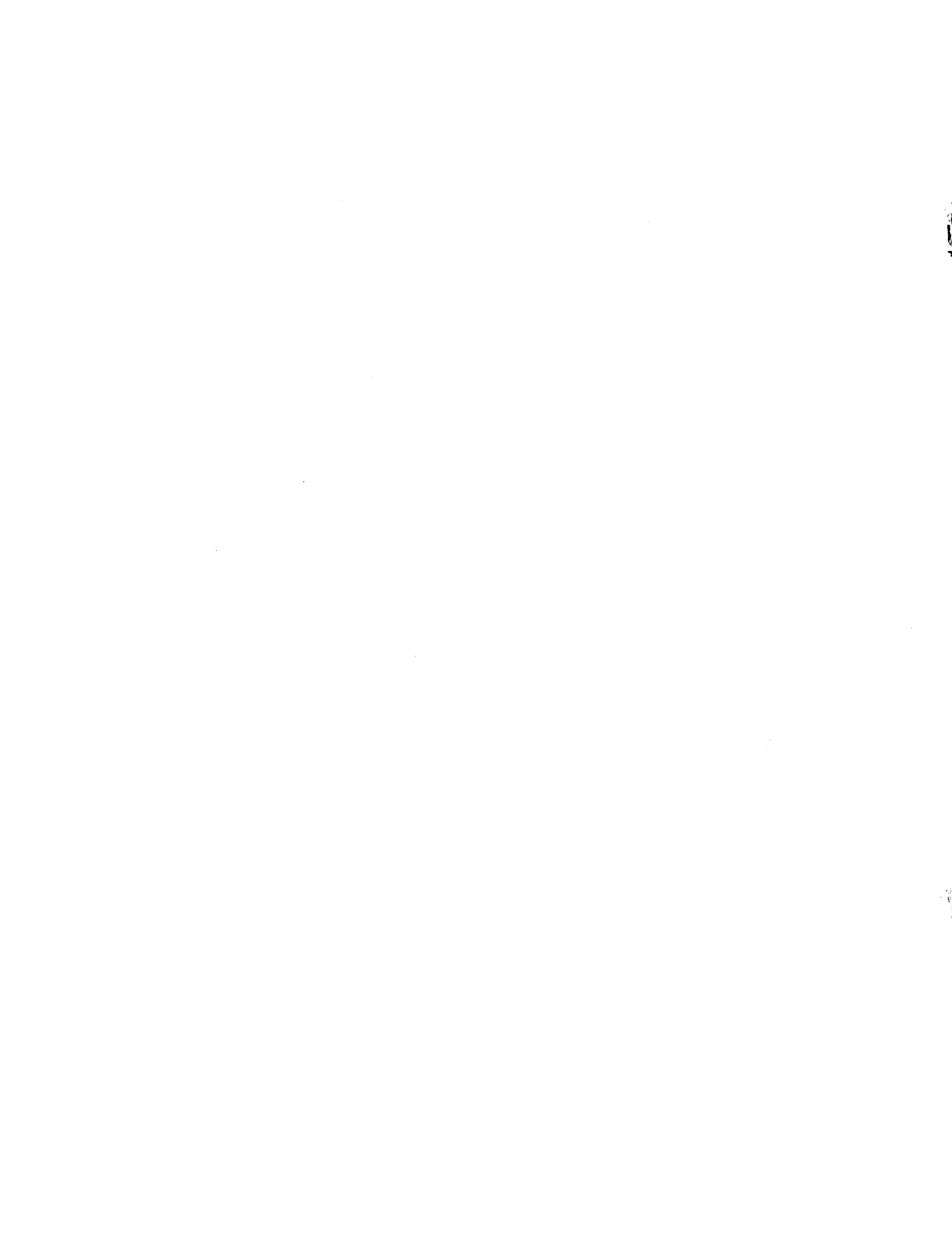
LESSON I

BELL SYSTEM PRACTICES

UNIT I



SOUTHERN BELL



PTC NO. 320

# RELAY & APPARATUS ADJUSTMENT

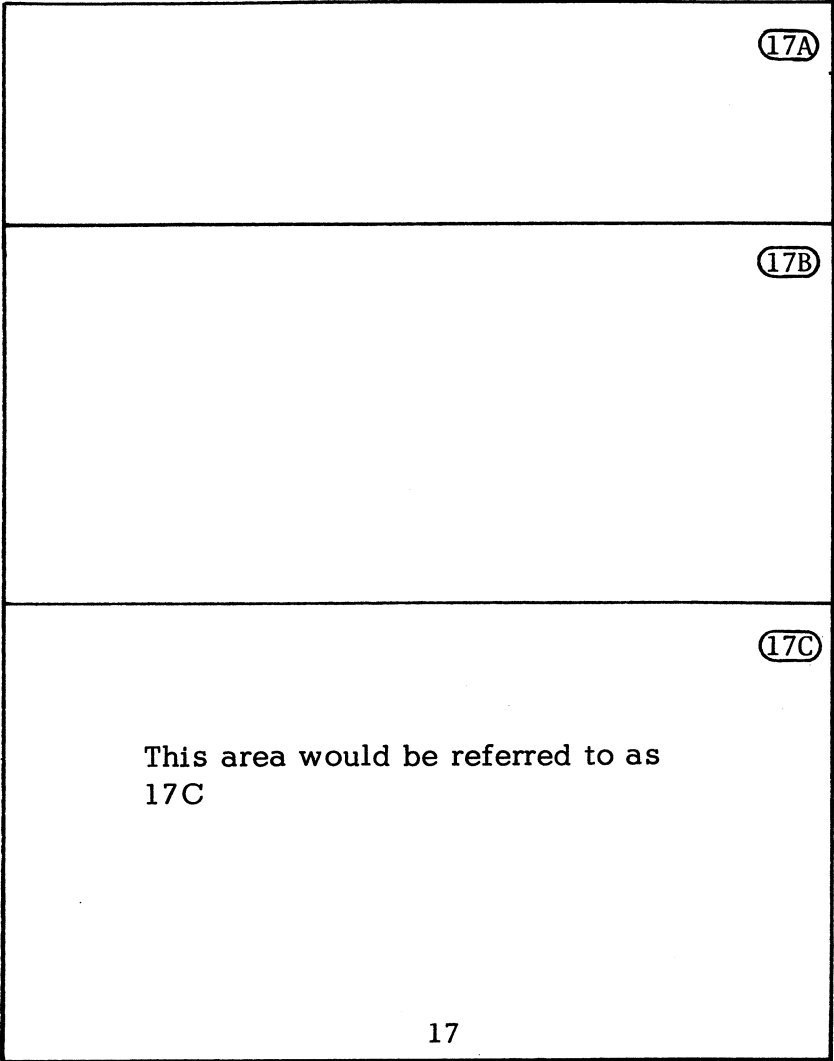
LESSON I

BELL SYSTEM PRACTICES

UNIT I

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SOUTHERN BELL



17A

← Frame A

17B

← Frame B

17C

← Frame C

This area would be referred to as  
17C

17

↑  
Page 17

## NOTE

This is a programmed workbook. The lesson material has been broken down into a large number of small steps which you will take one at a time. Each step is called a frame. On a page you will find one or more frames. Each frame has a number and letter. The number corresponds to the page number. See the left-hand page for an example.

In many of the frames you will be asked a question. When this happens, write your answer in the space provided and then turn to the indicated page and frame to check your answer. In this way, the lesson material will be adjusted to your needs and you will be able to proceed without continuing to study material you already understand.

Items presented on the left-hand pages of this workbook will serve as references and illustrations for the text on the right-hand pages.

Turn to 1A



OBJECTIVES

Given a set of BSPs, at the end of this lesson you will be able to . . .

- 1. State the three steps to be followed in locating information in the BSPs.
- 2. Locate information in the BSPs.
- 3. State where an addendum should be filed.

Your achievement of these objectives will be demonstrated by completing a written test with at least 80% of the questions answered correctly.

Continue to 1B

BACKGROUND

Frequently during your career with the Company your supervisor will ask you to perform a task that you have not done before. For example, you may be asked to adjust a type of relay that you have not adjusted before. Or you may have to use a test set that is new to you. On the other hand, you may be asked to do a task that you have done before, but you find that you have forgotten the exact steps to follow. How would you find out how to do these tasks? By looking up the procedures in reference books called Bell System Practices. We usually use the abbreviation BSP when referring to these practices.

Continue to 1C

The BSPs are organized using a 9-digit numbering plan (XXX-YYY-ZZZ). This numbering plan provides a convenient means for filing and ordering practices.

In this numbering plan the first three digits (XXX) are referred to as division numbers. They are used to designate major categories of information.

The second three digits (YYY) are referred to as subdivision numbers. They provide a means of breaking down a division into subdivisions of information.

The last three digits (ZZZ) are referred to as key numbers. They are used to indicate the class of material contained in a particular practice.

Turn to 3A





A number of indexes are provided in the BSPs. In this lesson we are concerned with only two: the Master Alphabetical Index and the Division Numerical Index.

The Master Alphabetical Index is located in Section 000-000-001 and lists all division subjects and their associated division numbers.

A Division Numerical Index (Section XXX-000-000) is provided for each division and lists all sections in the division along with their issue numbers and subjects.

Continue to 3B

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Now you will learn how to use the indexes to locate information in the BSPs.

Suppose you are going to adjust an AK-type relay and you need to know what procedure to follow. There are three steps to follow in locating this information.

The first step is to look in the Master Alphabetical Index (Section 000-000-001) under RELAYS for the division number.

Turn to the Master Alphabetical Index in your BSP book and determine the division number for RELAYS. (The AK is not a coin type relay.)

What is the division number for AK-type relays? 0410

Turn to 5B

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### How to Locate a Division Number

- ① Turn to Master Alphabetical Index.
- ② Locate "R" section.
- ③ Scan down items to the word RELAYS.

SECTION 000-000-001

RECORDS AND FORMS-RADIO .....	400	12F, E Repeater .....	103
RECTIFIERS .....	169	Voice Frequency	
REFLECTION LOSS DATA .....	304	Compatibility Information .....	179
REFLECTORS, PASSIVE RADIO .....	402	22 and 44 Type .....	332
REGENERATIVE REPEATERS .....	034	E Type .....	332
REGENERATORS .....	034	V Type .....	332
REGISTERS .....	030	Line Building Out Networks .....	332
REGULATORS,		REQUIREMENTS, GENERAL - (Divisions 020 to	
Speed .....	024	179) .....	020
Voltage .....	024	REQUIREMENT TABLES .....	005
<u>RELAYS,</u>		RESCUE PROCEDURES .....	010
Coin .....	506	RESISTORS .....	032
Other .....	<u>040</u>	RESTORATION	
REL MICROWAVE RADIO .....	408	Broadband .....	371
REPEATERS		RESTRICTION OF PLANT ACTIVITIES DURING EVENTS	
Test Sets		OF NATIONAL INTEREST, WELFARE OR EMERGENCY .	010
2G .....	103	RETURN LOSS DATA .....	304
Type N, O and ON Carrier Systems		RETURN LOSS TEST SET .....	103
Repeatered High-Frequency Line .....	362		

- ④ The Division would be 040 since the AK is not a coin relay.

You have determined that the division number for relays is 040. Now you are ready to go on to the second step.

The second step is to turn to the Numerical Index for division 040 and determine the subdivision and layer numbers for AK-type relay adjusting procedures.

Turn to the Numerical Index for division 040 and read paragraph 2.01.

Paragraph 2.01 tells you how the division is arranged. You are looking for information on the AK-type relay which is manufactured by Western Electric Co. and has an alphabetical code. From paragraph 2.01 you can see that you will be looking in section 040-5 of the index for the subdivision and layer numbers.

Using the Division Numerical Index, determine the subdivision and layer numbers for AK-type relay adjusting procedures.

What are the subdivision and layer numbers?

Subdivision 504 Layer 701

Turn to 7B

If you said the division number for AK-type relays is 040, you are correct.

If you gave the correct answer, go to 5A

If you did not give the correct answer refer to the illustration on the left-hand page for help in locating the division number.

When you understand how to find the division number you may continue with the lesson. Go to 5A

How to Locate Subdivision and Layer Numbers

① Turn to Division Numerical Index.

② Locate Section 040-5.

**ISS 49, SECTION 040-000-000**

040-5	RELAYS — WECO CODES — ALPHABETICAL	Section Number	Issue	Subject
040-500-701	3 A and AB Types — Requirements and Adjusting Procedures	Add040-502-701	1	AF, AG, and AJ Types — (Wire Spring Types) — Requirements and Adjusting Procedures (For Condensed Section, See 040-930-701)
		040-502-701	8	
040-500-801	3 A, AB, E, EA, F, H, M, R, T, 235, and 236 Types — Piece-Part Data and Replacement Procedures	040-502-801	6	AF, AG and AJ Type — Piece-Part Data and Replacement Procedures
040-502-101	2 AF-, AG-, and AJ-Types — (Wire Spring Type) — Description	Add040-504-701	1	AK Type — Requirements and Adjusting Procedures — (For Condensed Section, See 040-931-701)
		040-504-701	5	
		040-504-801	7	AK-Type — Piece-Part Data and Replacement Procedures

③ Scan 040-5 Section until you locate AK-Type Relay - Adjusting Procedures.

① Turn to correct BSP section.

**SECTION 040-504-701**

② Locate Paragraph 3.

③ Title of Paragraph 3.

**3. ADJUSTING PROCEDURES**

**3.001 *List of Tools, Gauges, Materials, and Test Apparatus***

Now you have determined the complete BSP number (040-504-701) for the adjusting procedures for AK-type relays. The third step is to use this number to locate the proper section in the BSP file.

Turn to Section 040-504-701 in your BSP book.

In this section, notice that paragraph 1. contains the General information about the AK-type relay. Paragraph 2. contains the Requirements for the AK-type relay.

What type of information is given in Paragraph 3?

Adjusting      Procedures

Go to 7C

If you said the subdivision is 504 and the layer is 701, you are correct.

If you gave the correct answers (go to 7A)

If you did not give the correct answers refer to the illustration on the left-hand page for help in determining the subdivision and layer numbers.

When you understand how to find the subdivision and layer numbers you may continue with the lesson. (Go to 7A)

If you said paragraph 3. contains the Adjusting Procedures, you are correct.

If you gave the correct answer (turn to 9A)

If you did not give the correct answer, refer to the illustration on the left-hand page. After looking at this illustration you may continue with the lesson. (Turn to 9A)



## SUMMARY

So far, in this lesson you have learned the 3 steps to follow in locating information in the BSPs. These steps are:

1. Use the Master Alphabetical Index to look up the division number.
2. Use the Division Numerical Index to look up the subdivision and layer numbers.
3. Use these numbers to locate the desired BSP in the BSP files.

Go to 9B

Now you will practice locating information in the BSPs.

In what BSP Section and paragraph would you find the list of tools required for adjusting a 324-type switch? (The 324-type switch is not magnetic and is not used for station applications.)

BSP 020-100-101, paragraph 3.011

Turn to 11A

## PRACTICE EXERCISE

What are the BSP and paragraph numbers for the following information?

	BSP	Para.
1. Method of operation of 35-type test set. (A common-usage test set.)	<u>100-101-111</u>	<u>4</u>
2. Lubrication requirements for 206-type selectors.	<u>026-106-101</u>	<u>2.03</u>
3. The meaning of the winding terminal designations for an AK-type relay as listed on a requirement table.	<u>000-100</u>	<u>1.01</u>

Turn to 13A

It should be filed ahead of page 1 of BSP 040-236-701.

Turn to 15A

① Turn to the Master Alphabetical Index.

SECTION 000-000-001

SIGNALS ..... 032  
 SIGNS, PUBLIC TELEPHONE ..... 508  
 SINGING POINT TEST SET ..... 103  
 SINGLE SIDEBAND PROGRAM SYSTEMS ..... 320

SWITCH PANELS ..... 030  
 SWITCHED CIRCUIT AUTOMATIC NETWORK (SCAN) .... 310  
 SWITCHED SERVICES NETWORKS ..... 309

② Locate the subject, SWITCHES

SKINNING CROSS CONNECTION WIRE ..... 069  
 SOCKETS ..... 032

SWITCHES,  
 Magnetic ..... 026  
 Station Application ..... 463  
 Other ..... 030  
 SWITCHING EQUIPMENT FOR PROGRAM SYSTEMS ..... 320

③ The 324-Type Switch would be in Division 030 since it is not magnetic or used for station applications.

④ Turn to Division Numerical Index.

ISS 49, SECTION 030-000-000

Section Number	Issue	Subject	Section Number	Issue	Subject
<b>030-7</b>		<b>SELECTOR MULTIPLE DESIGNATION CARDS, SWITCHES</b>	030-717-801	5	Switches — 304-, 305-, 306-, 307-, 308-, 314-, 315-, and 318-Type — Piece-Part Data and Replacement Procedures
030-700-701	3	188- and 189-Type Switches — Requirements and Adjusting Procedures			
030-705-301	3	Designation Cards for Selector Multiple — Method of Using — Step-by-Step Systems	Add030-720-701 <u>030-720-701</u>	1 8	Switches — 324, 325, 328, 334, and 338 Types — Requirements and Adjusting Procedures
030-705-501	8	197- and 198-Type Switches and Line Switches — Equipment Insulation and Bank Ground Test			
030-705-502	1	197- and Similar Type Switches — Insulation Resistance of Banks and Bank Multiple — Tests	Add030-720-801 030-720-801	1 5	Switches — 324, 325, 328, 334, and 338 Types — Piece-Part Data and Replacement Procedures

Page 3

⑤ Scan down columns in the SWITCHES Section until you locate the BSP number for 324-Type Switch - Adjusting Procedures.

⑥ Turn to this Section in BSP book.

SECTION 030-720-701

⑦ Turn to Paragraph 3.

⑧ Locate the paragraph number for the List of Tools.

**3. ADJUSTING PROCEDURES**

**3.001 List of Tools, Gauges, Materials, and Test Apparatus**



The correct answer is BSP 030-720-701, paragraph 3.001.

If you gave this answer turn to 9C

If you did not give the correct answer refer to the illustrations on the left-hand page. These illustrations will show you how to arrive at the correct answer.

Once you understand how the above answer was obtained you may continue the lesson. Turn to 9C



The correct answers for the practice exercise on page 9, frame C are:

	BSP	Para.
1.	<u>100-101-101</u>	<u>4.</u>
2.	<u>026-706-701</u>	<u>2.03</u>
3.	<u>005-120-103</u>	<u>2.31</u>

If you had difficulty in locating any of these answers, remember that when using the Master Alphabetical Index look for the major subjects such as, Test-Sets, Selectors and Requirement Tables rather than minor subjects.

Go to 13B

In using the BSP book you probably noticed the pink sheets located throughout the book. These are called addendum sheets. An addendum is issued to change or add information to the BSP sections.

An addendum may be issued in either of two forms. In one case, the new information is located on the pink addendum sheet. In the other case, replacement sheets are attached to the pink addendum sheet. The replacement sheets should be inserted in their proper places in the section and the replaced pages removed.

In both cases, the pink addendum sheet should be filed ahead of page 1 of the section for which it was issued.

Where should the pink addendum sheet for BSP 040-236-701 be filed? Ahead of page one of 040-236-701

Turn to 9D

ANSWERS TO REVIEW QUESTIONS

1. Use the Master Alphabetical Index to look up the division number.
2. Use the Division Numerical Index to look up the subdivision and layer numbers.
3. Use these numbers to locate the BSP in the BSP file.
4. BSP 100-138-101, paragraph 2.12.
5. Ahead of page 1 of the section for which the addendum was issued.

END OF LESSON

Ask the course administrator for Progress Test No. 1.



REVIEW QUESTIONS

Answer the following questions in the spaces provided.

1. What is the first step in locating information in the BSPs?

Use Master Alphabetical Index to find division no.

2. What is the second step?

Use division number to find sub-division number.

3. What is the third step?

Copy up subject to file.

4. What BSP section and paragraph tells about the Lamp Supply connection on the Contact Closure Test Set?

BSP 100-101-101, Paragraph 2.12

5. Where should the pink addendum sheet for a BSP section be filed?

at end of page in appropriate section

Turn to 13C