

BSP MP ITEMS COVERING SEQUENCE CHARTS,
OPERATIONAL SKETCHES, AND ASSOCIATED REFERENCE MATERIAL
GENERAL DESCRIPTION AND ORDERING AND FILING INSTRUCTIONS

1. GENERAL

- 1.01 This section describes BSP MP items and gives ordering and filing instructions.
- 1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

2. DESCRIPTION OF BSP MP ITEMS

2.01 General

BSP MP items are appropriate both for day-to-day maintenance work and for training plant personnel. They are furnished as black-on-white photo offset prints on 11" x 17" unfolded stock having the standard 7-hole BSP punching. There are three types of BSP MP items - namely, sequence charts (SC's), operational sketches (OS's), and reference material (RM's).

2.02 Sequence Charts (SC's)

A sequence chart is a graphic representation of the time order of operation of the relays and other apparatus involved in a portion of a switching system. To do this, the operation and the release of each relay or other device are shown by distinctive symbols. These symbols are then arranged in relative time order on the chart, from the top down, and connected by appropriate lines to show the interdependence of the successive operations. Attached is a sample SC, together with the Legend for SC's which explains the symbols used.

2.03 Operational Sketches (OS's)

An operational sketch is a circuit diagram representing in simplified form a portion of a switching system in such a fashion that the reader can comprehend the whole function depicted. To do this, boundaries of the conventional SD drawings are completely disregarded, free use is made of detached contacts, and the operating paths of all relays and other apparatus are shown completely from battery to ground. Attached is a sample OS, together with the Legend for OS's which explains the symbols used.

2.04 Reference Material (RM's)

Reference Material (RM's) furnish various types of supporting information supplementing sequence charts and operational sketches, such as indexes of relays, functional designations, and miscellaneous tables and charts.

3. ORDERING INSTRUCTIONS

- 3.01 The binders, the frontispiece and tabbed separator sheets, and the BSP MP items covered in these checking lists are arranged in Lists 1, 2, 3, etc. This permits ordering only those items which are required for a particular installation or school. Each of the individual checking lists for the system involved gives the details concerning the Lists contained therein.
- 3.02 List 1 specifies the binder for filing the BSP MP items. More than one may be required.
- 3.03 List 2 (or Lists 2A, 2B, etc.) specifies the frontispiece and tabbed separator sheets to be used in the binder (or binders).
- 3.04 Lists 3, 4, 5, -----20, etc., specify the BSP MP items.
- (a) Basic items required for all installations or schools are specified in List 3.
- (b) When appropriate, the basic items may be covered in two separate Lists. For example, the items for the service features may be in List 3 and the items for the testing equipment may be in List 20.
- (c) Items not required for all installations or schools, such as those covering optional features, may be covered in additional Lists 4, 5, etc.
- (d) When appropriate, a List may be divided into more than one group. For example, one group may include the SC's and RM's, and another group the OS's of List 3. If there is a List 4 it may be similarly divided. For installations or schools having both Lists 3 and 4, all of the SC's and RM's in these two Lists would

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be filed in numerical order and placed in one binder. Similarly all of the OS's in Lists 3 and 4 would be filed in numerical order and placed in another binder.

- 3.05 Orders for each individual List shall be worded as follows:

Quantity BSP Section _____.
List _____.

- 3.06 Orders for each individual MP item shall be worded as follows:

Quantity BSP item MP-_____.

- 3.07 If the BSP MP items, the frontispiece, and the tabbed separator sheets are to be collated and bound as provided for in the individual checking list, orders should be worded as follows:

Quantity BSP Section _____.
Lists _ and _, filed with frontispiece and separator sheets Lists _ and _, in binders List _.

- 3.08 New and reissued MP items can also be obtained automatically by placing a separate standing order on the Western Electric Company; such orders will be good for the current year and can be renewed each year as required. Or, where local regulations permit, the standing order may indicate that it is to remain in effect until further notice. Orders should be worded as follows:

Furnish (until further notice) or (for the year _____).

Quantity all new and reissued BSP MP items listed in BSP Section _____, List(s) _____, after Issue _____ (See Note)

Note: Show here the current issue of the checking list.

4. FILING INSTRUCTIONS

4.01 The checking lists will list each BSP MP item by SC, OS, or RM number (in numerical order), BSP item MP number, issue number, and subject, in order in which the material should be filed and collated.

4.02 As is the case with all other checking lists, these checking lists will be completely reissued rather than addended, when new or reissued BSP MP items are released. The reissued checking lists will indicate the changed items.

Important: It is essential to know at all times the status of any set of BSP MP items with reference to the associated checking list. Provision is therefore made on each frontispiece for recording the issue or issues of the checking list and the numbers of the Lists (List 3, List 4 etc.) which cover the material currently in the binder. Only these issues of the checking list should be retained in the binder; all others should be destroyed.

Attached samples:

- SC 000-2 Legend for Sequence Charts
- SC 109-1 Pretranslation - Register Signaled to Select Marker After Receiving 7 Digits
- OS 000-2 Legend for Operational Sketches
- OS 109-1 Calling Line Location - Identification, Selection and Registration of Horizontal Group - Combined or Dial Tone Marker.

MASTER LEGEND FOR SEQUENCE CHARTS

- RELAY OR OTHER APPARATUS OPERATIONS AND RELEASES ONLY ARE SHOWN.
- VERTICAL PROGRESSION DOWNWARD SHOWS RELATIVE TIME PHASE OF RELAY OR OTHER APPARATUS MOVEMENTS (OPERATION OR RELEASE).
- COORDINATES ARE USED TO LOCATE THE POSITION OF APPARATUS ON SC'S. THE HORIZONTAL COORDINATE IS ALPHABETICALLY DESIGNATED. THE VERTICAL COORDINATE IS NUMERICALLY DESIGNATED STARTING WITH 101 ON SHEET 1, 201 ON SHEET 2, ETC. THUS D304 MEANS VERTICAL COLUMN D, SHEET 3, HORIZONTAL LINE 4.
- THE FOLLOWING TABLE SHOWS, ON A LINE BASIS, THE OPERATE AND RELEASE TIMES WHICH ARE USED FOR THE APPARATUS:

APPARATUS	OPERATE	RELEASE
ALL RELAYS EXCEPT SLOW OPERATE, SLOW RELEASE, TIMED AND MULTICONTACT	1 LINE	1 LINE
SLOW OPERATE RELAYS	2 LINES(MIN.)	1 LINE
SLOW RELEASE RELAYS	1 LINE	2 LINES (MIN.)
TIMED RELAYS, COLD CATHODE TUBES ETC.	SEE NOTE 11	SEE NOTE 11
MULTICONTACT RELAYS	2 LINES	1 LINE
SELECT MAGNETS	2 LINES	1 LINE
HOLD MAGNETS	2 LINES	1 LINE
PERFORATOR MAGNETS	2 LINES	2 LINES
OTHER APPARATUS	1 LINE	1 LINE

5. OPERATE SYMBOLS:

- EXPLANATION:
- (A) AL RELAY OR OTHER APPARATUS COMES TO FULLY OPERATED CONDITION. FOR POLAR RELAYS WITHOUT BIASING SPRINGS, THE ARMATURE HAS MOVED TO FRONT OR LEFT CONTACT.
- (B) RDR PIN READER PINS ARE MOVED TO PASS THROUGH THE PERFORATED HOLES IN TAPE. READER PIN CONTACTS ARE CLOSED ONLY IF A HOLE IS PERFORATED.
- (C) (B) TC INTERRUPTER OR TIMER HAS CLOSED ITS B CONTACT.

6. RELEASE SYMBOLS:

- EXPLANATION:
- (A) AL RELAY OR OTHER APPARATUS COMES TO FULLY RELEASED CONDITION. FOR POLAR RELAYS WITHOUT BIASING SPRINGS, THE ARMATURE HAS MOVED TO BACK OR RIGHT CONTACT.
- (B) RDR PIN READER PINS ARE MOVED AWAY FROM THE TAPE AND ALL READER CONTACTS ARE OPENED.
- (C) (C) TC INTERRUPTER OR TIMER HAS OPENED ITS PU CONTACT.

7. COMBINED OPERATE AND RELEASE SYMBOL:

- EXPLANATION:
- Z RELAY OR OTHER APPARATUS HAS EITHER OPERATED OR RELEASED.

8. SYMBOL DESIGNATIONS:

THE OPERATE (X) AND RELEASE (+) SYMBOLS ARE USED IN CONJUNCTION WITH THE FOLLOWING DESIGNATIONS:

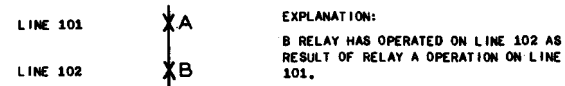
- (A) RELAY WINDING DESIGNATIONS:
- EXPLANATION:
- C- ONE OR MORE OF CO TO C_n OR CA TO C_n
 - CO-9 OR CO-C_n ALL OF CO TO C₉ OR CO TO C_n INCLUSIVE
 - FA-D ALL OF FA TO FD INCLUSIVE
 - A,C BOTH A AND C
 - CB-(-1) ALL CB- EXCEPT ONE
 - HG $\frac{2}{5}$ A COMBINATION OF "2 OUT OF 5"
 - L/R EITHER L OR R
 - RF2/RF-/RFB ONE OF A SERIES RF2 TO RFB
 - (TOP) MC TOP HALF OF MC MULTICONTACT RELAY
 - (BOT) MC BOTTOM HALF OF MC MULTICONTACT RELAY
 - MC BOTH HALVES OF MC MULTICONTACT RELAY

(B) OTHER APPARATUS DESIGNATIONS:

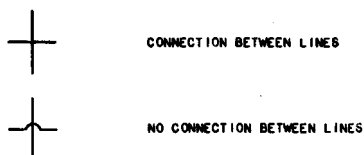
- EXPLANATION:
- AR KEY AR KEY CONTACT
 - AJACK A JACK CONTACT
 - ALLAMP AL LAMP (X) LIGHTED, (+) EXTINGUISHED
 - THOLD T HOLD MAGNET
 - JSEL J SELECT MAGNET
 - USTEP 10/20 U STEP MAGNET. BRUSHES ARE IN CONTACT WITH BANK TERMINAL 10 OR 20
 - PACMAG PAC MAGNET
 - A2PERF A2 PERFORATOR MAGNET
 - VARVARISTOR VAR VARISTOR (X) CONDUCTING, (+) NON-CONDUCTING
 - TWATUBE TWA TUBE (X) CONDUCTING, (+) NON-CONDUCTING
 - CL- PH. TRAN. CL- PHOTO TRANSISTOR (X) CONDUCTING, (+) NON-CONDUCTING

9. CONNECTING LINES:

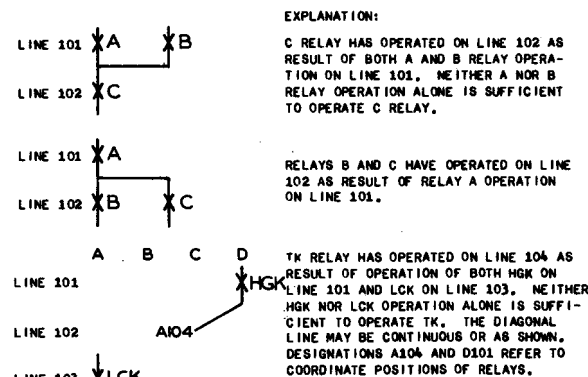
- (A) VERTICAL LINES ARE USED TO LINK CAUSES WITH EFFECTS ON SUCCEEDING LINES AS:



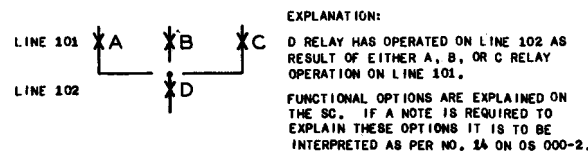
- (B) HORIZONTAL AND VERTICAL LINE COMBINATIONS ARE USED AS FOLLOWS:



- (C) HORIZONTAL AND OBLIQUE LINES ARE USED TO CONNECT MULTIPLE CAUSES PRODUCING A COMMON EFFECT OR TO CONNECT MULTIPLE EFFECTS PRODUCED BY THE SAME CAUSE AS:

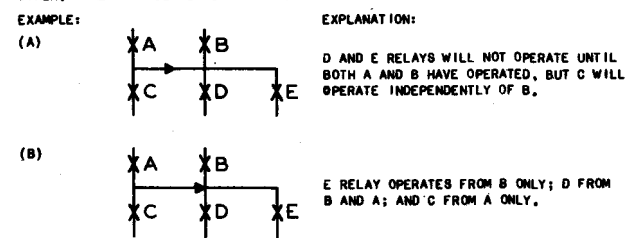


- (D) APPARATUS OPTIONS OR FUNCTIONAL OPTIONS ARE SHOWN BY A BREAK IN THE HORIZONTAL AND VERTICAL CONNECTING LINES.

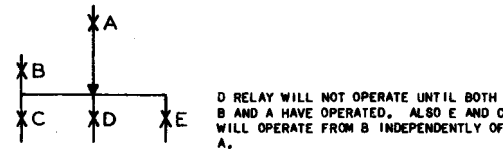


10. ARROWHEADS:

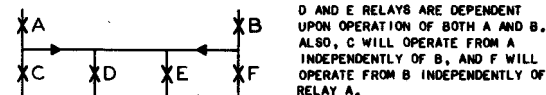
- ARROWHEADS ARE USED TO BLOCK AND LIMIT EFFECTS OF RELAY OPERATIONS ON EACH OTHER. THEY MAY BE PLACED AT THREE DIFFERENT POSITIONS ON CONNECTING LINES.



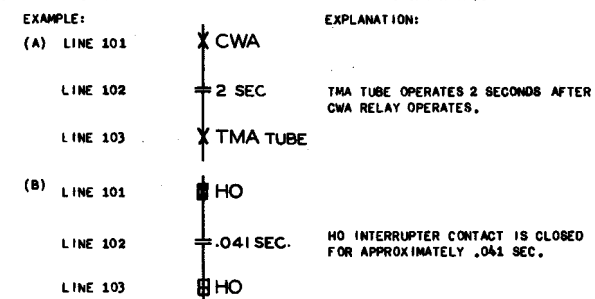
(C)



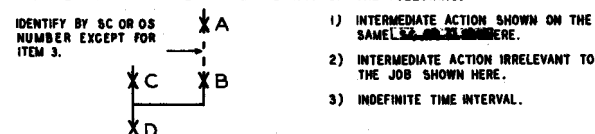
- (D) IN SOME CASES TWO ARROWHEADS MAY BE SHOWN AS:



11. THE TIME DELAY INTRODUCED BY A TIMED CIRCUIT IS SHOWN THUS:

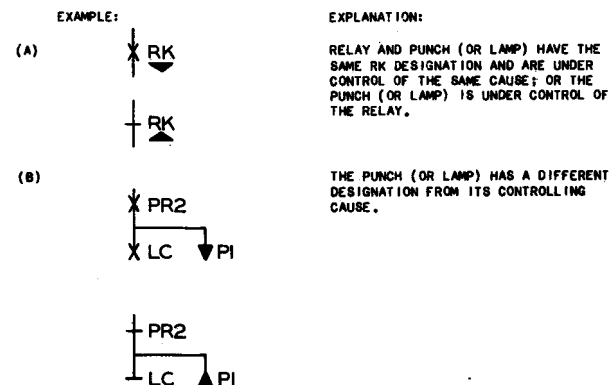


12. A DOTTED VERTICAL LINE MAY DENOTE ANY OF THE FOLLOWING:



13. TROUBLE RECORD PUNCH OR LAMP DESIGNATIONS ARE SHOWN ON SEQUENCE CHARTS IN THE FOLLOWING MANNER:

- A SOLID INVERTED TRIANGLE (▼) INDICATES THAT A PERFORATION IS MADE OR A LAMP IS LIGHTED IF A TROUBLE RECORD IS TAKEN AT THIS TIME.
- A SOLID UPRIGHT TRIANGLE (▲) INDICATES THAT A PERFORATION IS NOT MADE OR A LAMP IS NOT LIGHTED IF A TROUBLE RECORD IS TAKEN AT THIS TIME.



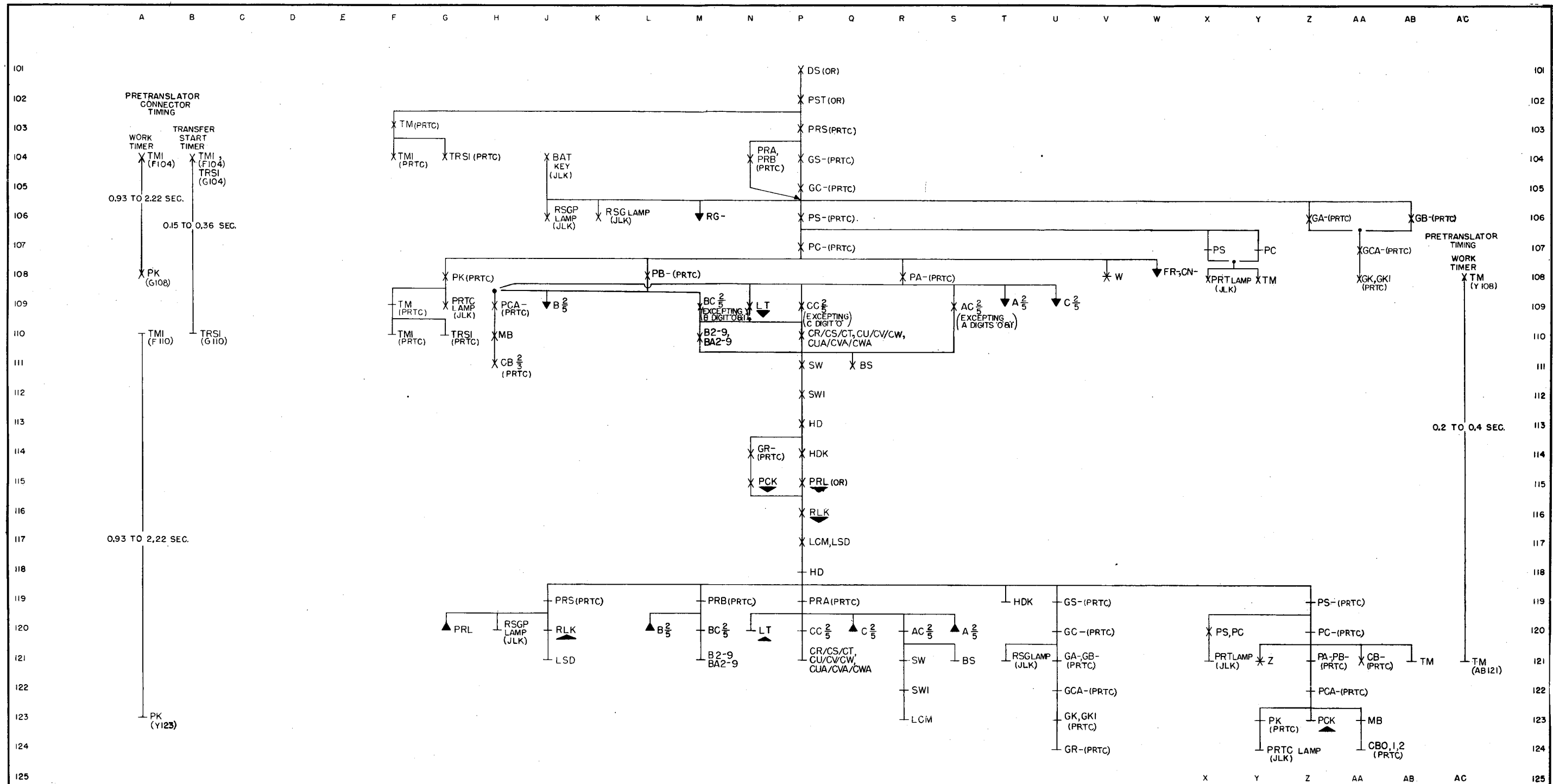
14.



THE CIRCUIT MOST FREQUENTLY USED IN A PARTICULAR SEQUENCE CHART IS IDENTIFIED BY AN ASTERISK OPPOSITE ITS SC NUMBER IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK. NO CIRCUIT ABBREVIATIONS ARE SHOWN ON THE SEQUENCE CHART NEXT TO RELAYS ASSOCIATED WITH THIS CIRCUIT. THE CIRCUITS IN WHICH ALL OTHER RELAYS APPEAR ARE SHOWN IN BRACKETS ADJACENT TO THE RELAY DESIGNATIONS ON THE SEQUENCE CHART (SEE EXAMPLE)

TRANSLATOR CKT. 80-25754-01, 188. 8
TRANSVERTER CKT. 80-25802-01, 188. 3

15. THIS LEGEND APPLIES, WITH SOME EXCEPTIONS, TO SEQUENCE CHARTS PROVIDED ON OS'S. SEE OS 000-2, NO. 13A.



NOTES:
 1. SEE OS 134-1, 135-1, 136-1, 137-1, 138-1 AND 139-1.

DP ORIGINATING REGISTER CKT. SD-25551-01, ISS.25
 *PRETRANSLATOR CKT. SD-25568-01, ISS. 9
 PRETRANSLATOR CONNECTOR CKT. SD-25569-01, ISS. 7
 M T F JACK, LAMP AND KEY CKT. SD-25762-01, ISS. 9

PRETRANSLATION
 REGISTER SIGNALLED
 TO SELECT MARKER AFTER RECEIVING
 7 DIGITS

MASTER LEGEND FOR OPERATIONAL SKETCHES

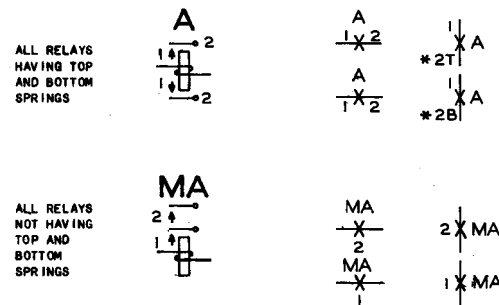
THE SYMBOLS AND CONVENTIONS USED ON OPERATIONAL SKETCHES (OS-) ARE THE SAME AS THOSE USED ON THE STANDARD CIRCUIT SCHEMATIC DRAWINGS (SD-) WITH THE FOLLOWING EXCEPTIONS:

1. ATTACHED CONTACTS MAY BE POSITIONED WITHOUT REGARD TO THEIR TOP OR BOTTOM LOCATIONS AS:

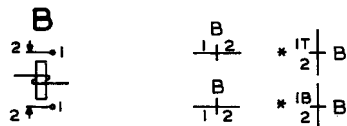


2. DETACHED CONTACT SYMBOLS ARE USED WHENEVER THEY AID IN SIMPLIFYING THE SKETCHES. THE DETACHED CONTACTS ARE SHOWN TO THE RIGHT AND THE ATTACHED CONTACTS TO THE LEFT, AS:

(A) MAKE CONTACTS



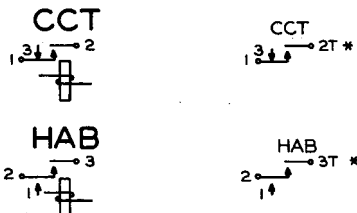
(B) BREAK CONTACTS:



(C) TRANSFER CONTACTS:



(D) OTHER CONTACTS:



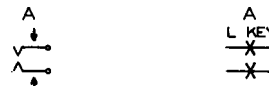
* ONLY THE ARMATURE SPRING IS DESIGNATED TOP OR BOT.
(E) JACK WITH MAKE CONTACTS:



(F) JACK WITH BREAK CONTACTS:



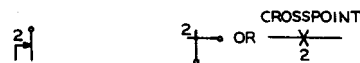
(G) LOCKING KEY WITH MAKE CONTACTS:



(H) NON-LOCKING KEY WITH BREAK CONTACT:



(J) CROSSBAR SELECTOR-TYPE SWITCH:



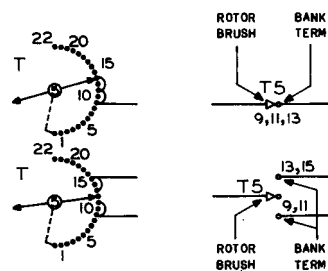
(K) READER INTERRUPTER CONTACT:



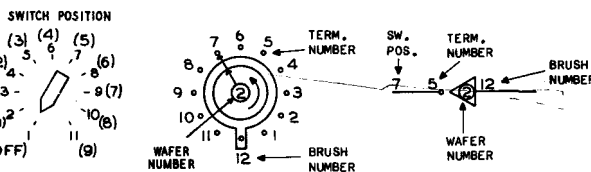
(L) TIMER CONTACT:



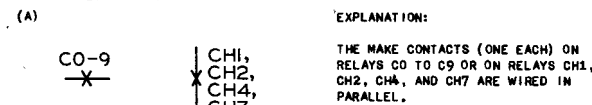
(M) 206 AND SIMILAR TYPE SELECTORS:



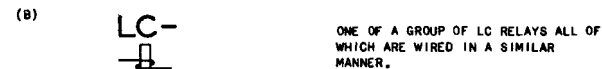
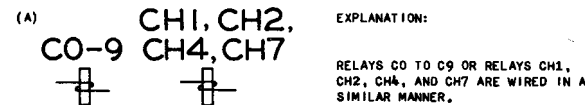
(N) WAFER SWITCH:



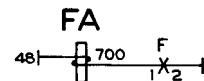
3. CONTACT DESIGNATION:



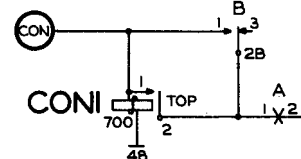
4. WINDING DESIGNATION:



5. BATTERY SYMBOL WITH THE NOMINAL VOLTAGE IS SHOWN THIS:



6. TROUBLE RECORD PUNCH OR LAMP DESIGNATIONS ARE ENCLOSED IN A CIRCLE. FOR EXAMPLE.



7. IN GENERAL THE OHMS SYMBOL (Ω) USED ON CIRCUIT SCHEMATIC DRAWINGS IS OMITTED.

8. IN GENERAL, STRAPPING OR MULTIPLE CONVENTIONS ARE OMITTED.

9. CONTACT PROTECTION IS GENERALLY OMITTED.

10. APPARATUS CODES FOR VACUUM TUBES ONLY ARE SHOWN.

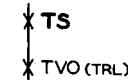
11. INDICATION OF INNER ENDS AND TERMINAL NUMBERING OF WINDINGS ARE OMITTED. HOWEVER ON POLAR RELAYS, WINDING TERMINAL NUMBERS AND POLARIZATION ARE SHOWN.

12. POLAR RELAYS WITH BIASING SPRINGS ARE INDICATED BY BS FOLLOWING THE RELAY DESIGNATION. POLAR RELAYS WITHOUT BIASING SPRINGS ARE INDICATED BY NBS FOLLOWING THE RELAY DESIGNATION.

13. SEQUENCE CHARTS ON OPERATIONAL SKETCHES:
(A) SEQUENCE CHARTS ARE GENERALLY PROVIDED ON EACH OS. THESE DIFFER FROM THE SC'S MADE FOR A COMPLETE JOB OR CALL IN THE FOLLOWING MANNER:

- 1) ONLY A SUFFICIENT NUMBER OF RELAY MOVEMENTS ARE SHOWN WHICH PERMIT PROPER UNDERSTANDING OF THE OPERATING PATHS APPEARING ON THE OS.
- 2) THE DESIGNATIONS OF ALL APPARATUS FOR WHICH THE OPERATING PATHS ARE SHOWN ON THE OS ARE INDICATED LARGER AND HEAVIER THAN DESIGNATIONS IDENTIFYING OTHER APPARATUS.
- 3) PUNCH DESIGNATIONS ARE OMITTED.
- 4) COORDINATES ARE OMITTED.

(B) EXAMPLE:



EXPLANATION: THE CIRCUIT MOST FREQUENTLY USED IN A PARTICULAR SEQUENCE CHART IS IDENTIFIED BY AN ALPHABETIC LETTER OPPOSITE ITS SD NUMBER IN THE LIST OF DRAWINGS ABOVE THE TITLE BLOCK. NO CIRCUIT ABBREVIATIONS ARE SHOWN ON THE SEQUENCE CHART NEXT TO APPARATUS ASSOCIATED WITH THIS CIRCUIT. THE CIRCUITS IN WHICH ALL OTHER APPARATUS APPEARS ARE SHOWN IN BRACKETS ADJACENT TO THE APPARATUS DESIGNATIONS ON THE SEQUENCE CHART (SEE EXAMPLE).

* TRANSVERTER CKT. SD-25754-01, ISS. 8
TRANSLATOR CKT. SD-25802-01, ISS. 3

14. OPTIONS ARE DESCRIBED BY A NOTE AS SHOWN BELOW:

NOTE:

OS OPTION	FEATURE OR OPTION	SD OPTION	SD
A	OPERATION WITH INTERTOLL AND TWO-WAY TRUNKS	N	25579-01
B	NO OPERATION WITH INTERTOLL AND TWO-WAY TRUNKS	LOOPED LEADS	
E	WHEN AMA IS PROVIDED	FIG. 4	25579-01
F		ZY AND FIG. 12	

THIS NOTE IS INTERPRETED IN THE FOLLOWING MANNER:

- (A) THE OS OPTION COLUMN LISTS THE LETTERS ARBITRARILY ASSIGNED TO FEATURES OR OPTIONS SHOWN ON THE PARTICULAR OS.
- (B) THE FEATURE OR OPTION COLUMN BRIEFLY DESCRIBES THE FEATURES OR OPTIONS SPECIFIED ON THE OS.
- (C) THE SD OPTION COLUMN LISTS THE SD OPTIONS CORRESPONDING TO THE OS OPTIONS WHEN APPLICABLE. THESE OPTIONS ARE ON THE PARTICULAR ISSUE OF THE SD LISTED OVER THE TITLE BOX ON THE OS. IN SOME CASES, MORE THAN ONE OPTION MAY BE SHOWN FOR A PARTICULAR FEATURE (SEE OS OPTIONS E AND F). THESE USUALLY RESULT FROM IMPROVEMENTS INCORPORATED ON B OR D ISSUES OF THE ASSOCIATED SD. THE OPTIONS LISTED MAY NOT APPEAR ON EARLIER ISSUES OF THE SD. IF THEY DO NOT APPEAR ON THE SD ISSUE AVAILABLE IN THE OFFICE, IT WILL BE NECESSARY TO DETERMINE BY COMPARISON OF THE CIRCUIT ARRANGEMENTS ON THE OS AND SD AVAILABLE WHICH OPTIONS ARE INSTALLED. IF THEY DO APPEAR ON THE SD AVAILABLE, THE OPTIONS INSTALLED CAN BE DETERMINED FROM THE OFFICE WIRING LISTS OR FROM THE RECORD OF FIGURES, WIRING AND APPARATUS CHANGES ON THE SD.
- (D) THE SD COLUMN LISTS THE SD NUMBER ON WHICH THE OPTIONS DESCRIBED IN (C) APPEAR.

