

EXPLANATION
OF
200-LINE
LINE FINDER UNIT CIRCUIT
H-75311

FEATURES

1. The function of a Linefinder is to find a calling line (terminating on its bank) and to extend it to an idle first Selector or equivalent switch.
2. Each subscriber line terminates on a line circuit and is connected to the banks of a group of Linefinders. Various line circuits, as shown on H-75318, may be used with this Linefinder circuit.
3. The Linefinders of this circuit are two-motion switches with 600-pt. banks; i.e. 200 lines can be terminated on each Finder switch.
4. Each Finder has two sets of regular wipers. When a Finder is searching for a calling line, the two sets of wipers simultaneously test two different lines, but only one line and one set of wipers can be extended to an idle first Selector. Each Finder also has a vertical bank and wiper.
5. Each Finder group can serve 200 lines and has a number of Linefinders as required by the traffic originated by these 200 lines.
6. The Linefinders of each group are normally divided into two operating subgroups, group A and group B, each serving 100 lines normally. Sometimes group B is not equipped, in which case all traffic is handled by group A.
7. The line relays are numbered 11 - 00 and 111 - 100. Line relays 11 - 50 and 111 - 150 are associated with group A and the others are associated with group B when group B equipment is provided.
8. Linefinders of group A normally search only for calls from lines in group A; Finders in group B normally search only for calls from lines in group B. When all Finders of one group are busy, the finders of the other group will handle calls from lines in both groups.
9. Lines 11 - 50 and 111 - 150 terminate on levels 1 to 5 of Linefinders in group A. Lines 61 - 00 and 161 - 100 of group B terminate on levels 1 to 5 of Linefinders in group B. Therefore, under normal traffic conditions, no Linefinders need make more than five vertical steps.

Lines in group A also terminate on levels 6 to 0 of Finders in group B, and lines in group B also terminate on levels 6 to 0 of Finders in group A. Therefore, a Linefinder makes more than five vertical steps only when helping out the other groups under heavy traffic conditions or when group B is not equipped. The bank multiple wiring is reversed between groups A and B so that lines on level 1 of one group are connected to level 0 of the other group; lines on level 2 are connected to level 9 of the other group, etc.

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10. The operation of the Linefinders is controlled by group relays. One set of group relays is associated with group A and another with group B (if equipped).
11. Only one Linefinder can operate at one time in each group; but two Finders can operate simultaneously if they are controlled by different group relays.
12. A rotary distributor switch is associated with each set of group relays and serves as a call allotter. It allots successive calls to different finders, one after the other. On the average, each Finder carries about the same amount of traffic. There is no first choice, second choice, etc. between Finders.
13. Normally as long as idle Finders are available, one Finder in each group is ready to take the next call. A start signal circuit closed by the operation of the line relay of the calling line starts the operation of the group relays and a Finder.
14. The level on which the calling line is terminated is marked on the vertical banks of all Finders. The vertical motion of the finder assigned to the call is stopped when the vertical wiper of the Finder encounters this marking.
15. The Linefinder bank terminal of the calling line is marked by battery on the C-bank. The rotary motion of the Finder is stopped when it encounters this battery.
16. If a Finder fails to find a calling line within a certain period, the control of the call is switched to the other group and the other set of group relays.
17. The Finders can be arranged for restricted levels in both groups or for upper groups only. Normal Post Springs are provided when this service is required. The Normal Post Springs are also used for calls of service identification when used in an office equipped with Type A SAIT equipment. When used with Type A SAIT equipment, the Normal Post Springs do not necessarily restrict subscribers but may just indicate a class of service rate for ticketing purposes.

OPERATION

1. Originating A Call

1.1 Seizure (Operated: V.O.N. springs)

When the calling subscriber closes the loop, the circuit is closed to the line relay (FIG. 1) of this line. Line relay L operates, grounds lead CN to the CONN. BANKS (marking this line busy on the connector banks), grounds the vertical bank contact corresponding to the level associated with the calling line, and connects relay CO to the C-contact of the Finder banks to mark the position of the calling line on the regular bank.

1.2 Start of Signal Circuit

The start lead of each line circuit is connected to one of the 10 start and level marking leads shown in FIG. 2. Each start lead is common to 20 lines as follows:

Lines 11 to 10 and 111 to 110 are connected to start lead 1.

"	21	"	20	"	121	"	120	"	"	"	"	"	2
"	31	"	30	"	131	"	130	"	"	"	"	"	3
"	41	"	40	"	141	"	140	"	"	"	"	"	4
"	51	"	50	"	151	"	150	"	"	"	"	"	5
"	61	"	60	"	161	"	160	"	"	"	"	"	6
"	71	"	70	"	171	"	170	"	"	"	"	"	7
"	81	"	80	"	181	"	180	"	"	"	"	"	8
"	91	"	90	"	191	"	190	"	"	"	"	"	9
"	01	"	00	"	101	"	100	"	"	"	"	"	0

Each group of 20 lines connected to the same start lead is connected to one level of Finders (the lower numbered 10 to the lower line bank and the other 10 to the upper line bank; the C-leads of all 20 lines are connected to one level of the C-banks).

Each start lead terminates directly on the vertical bank contact of the level to which the associated 20 line circuits are connected. This connection of the start lead serves to mark the calling level and to stop the vertical action of the Finder. Due to the reversal of the bank wiring between linefinder groups A and B, the connection of the start leads is also reversed between the two groups so that the 10 start leads are connected to the following vertical banks.

Start lead 1 to level 1 of Finders in group A.

"	"	2	"	"	2	"	"	"	"	A	and level 9 of group B.
"	"	3	"	"	3	"	"	"	"	A	" " 8 " " B.
"	"	4	"	"	4	"	"	"	"	A	" " 7 " " B.
"	"	5	"	"	5	"	"	"	"	A	" " 6 " " B.
"	"	6	"	"	6	"	"	"	"	A	" " 5 " " B.
"	"	7	"	"	7	"	"	"	"	A	" " 4 " " B.
"	"	8	"	"	8	"	"	"	"	A	" " 3 " " B.
"	"	9	"	"	9	"	"	"	"	A	" " 2 " " B.
"	"	0.									to level 1 " " B.

Vertical bank contact 10 is permanently grounded in both groups. Each start lead also terminates on a 2,000 ohm resistor. The five resistors for start leads 1-5 are commoned and form the start lead A which is normally connected to relay C of the group relays A. The other five resistors (for start leads 6-10) are also commoned and form the start lead B which is normally connected to relay C of group relays B. This division of the 10 start leads from the line circuits into common start leads A and B determines the control of a call by either group relays A or B. If group B is not equipped, all 10 start leads are normally connected to relay C of group A (strap "E" used).

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In the following Explanation, group A is considered entirely: the operation of group B being exactly the same.

In order to facilitate describing the operation of this circuit, the relays of FIG.'s 5 and 6 are numbered with the number of the FIG., for example, relay B is called either relay B5 or B6. The relays in the group relay circuit are referred to by their letter only. It will be assumed that FIG. 5A is used in describing Section 1 of this explanation ("W", "X", "Y" and "Z" wiring and apparatus are omitted; "C" wiring is used).

Relay B is normally energized by ground received from the free linefinders associated with the finder group. The distributor switch is normally connected to an idle finder.

Ground received over a start lead closes C. Relay C operates, closes F and N (in series with magnet MM of the distributor switch). Relay N operates (but not the motor magnet MM), grounds lead F.ST. (completing a circuit to B5 or B6 of a pre-selected idle finder), connects a multiple ground to B, closes a pre-energizing circuit to #2K and #2J, and extends A to the lead INT. Relay F operates, closes a locking circuit to N, grounds lead TST and prepares vertical and rotary test circuits by grounding leads TEST-1 and TEST-2.

F also grounds a lead connected to jack 14L. This lead terminates on jack 16L of the group relays B. As long as there are idle finders in both groups, the ground from F is extended to vertical bank contact 6 of GRP. B and from there to vertical bank contact 5 of GRP. A. This ground prevents a Finder from moving higher than the fifth level as long as there are idle finders in both groups. A corresponding circuit exist between group relays B and the fifth vertical bank contact GRP. B.

Relay B5 or B6 operates in the Finder closes #2 A, normally closes #2 D5 or D6 across leads "-" and "+" to pre-energize the A relay of the first selector, connects ground to the C wipers through K and J, connects the vertical bank's wiper to battery through #2 M, and prepares the circuits to the VERT. and ROT. magnets. Relay A operates and closes the VERT. magnet.

When used in a Director office, "D" wiring is used; battery through #2 D5 or D6 connected to line + to pre-energize the A relay of the first selector. This prevents a false leakage test in the Director if a call requiring ticketing is originated.

1.3 Vertical Stepping (Operated: Line relay L and relays A, B, C, F, N and B5 or B6 and V.O.N. springs)

The VERT. magnet of the Finder operates and elevates the shaft and the wipers one step. The Finder V.O.N. springs restore on the first step. The VERT. INT. springs operate and open A, which restores and opens the VERT. magnet. When the VERT. magnet restores, it closes the VERT. INT. springs; this in turn operates A.

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The VERT. magnet operates again; this action continues until the vertical wiper reaches the VERT. BANK level marked by ground from the line circuit over a start lead. This closes #2 M. Relay M operates, closes its own locking circuit to its #1 winding in series with #2 P, and opens the VERT. magnet. The VERT. magnet restores and closes A. Relay P operates, closes its locking circuit to the #1 winding over the "X" contacts, opens both windings of M, switches the pulsing lead from the VERT. to the ROT. magnet, grounds lead P. C. METER, opens #2 A, and closes #1 A and #2 A in series to alter the relay-interrupted rotary hunting speed. Relay M restores and closes the ROT. magnet.

1.4 Rotary Stepping (Operated: Line relay L and relays A, B, C, F, N, P and B5 or B6)

The ROT. magnet operates and rotates the shaft and the wipers one step, operating the ROT. INT. springs.

The ROT. magnet and A operate alternately as described in Section 1.3 until one of the C wipers finds the bank contact corresponding to the subscriber's line which is marked by battery through CO. Relay K (or J) operates in series with CO. Either relay, on operating, opens the ROT. magnet to prevent further stepping.

1.5 Extending Calling Line to Selector

If the subscriber's line is on the upper bank, relay K operates, opens the ROT. magnet, and closes A5 or A6. The ROT. magnet restores and closes A. Relay A5 or A6 operates, connects leads "+", "-", and C from the selector to leads "+", "-", and C of the LINE CKT. UPPER BK., and grounds lead C.

If the subscriber's line is on the lower bank, J operates, opens the ROT. magnet and closes D5 or D6. Relay D5 or D6 operates, connects leads "+", "-", and C from the selector to leads "+", "-", and C of the LINE CKT. LOWER BANK, and grounds lead C.

In case two line relays are operated and on the same rotary position (such as 22 & 122), both C contacts of the same rotary position have battery connected, both J and K operate; but K, in operating, opens D5 or D6, and thus the upper bank contacts have preference in switching.

The circuit to the A5 or A6 and D5 or D6 relays is closed through the contacts of A. The operation of A depends upon the restoring of the ROT. INT. springs; thus no switch through operation can take place until the ROT. magnet in the finder has fully restored.

Should one of the C wipers pass over a contact at the moment positive booster battery is on that contact for operating a meter associated

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with that line and contact, the diodes RA and RB in series with #1 K and #1 J offer high resistance to current of such direction so that neither relay could operate.

Ground on lead C from the selector is also extended to wiper C connected to the bank contact of the calling line and closes CO at the same time as A5 or A6 (or D5 or D6) operates. Relay CO operates, locks over the "X" contacts and opens line relay L. Line relay L restores, removes ground from the START lead and connects leads CN and BOOSTER BAT. METER to lead C.

The line loop is now connected to the succeeding Selector and CO and A5 or A6 (or D5 or D6) are held operated by ground received over lead C from the Selector associated with the Linefinder. This same ground marks lead CN to the connector banks and marks this line busy to all incoming calls.

1.6 Distributor Selects Next Idle Finder (Operated: Relays CO, A, B, C, F, K (or J), N, P & B5 or B6, A5 or A6 (or D5 or D6))

The removal of ground from lead START opens C which restores, if no other call has been originated in the group, and removes ground from lead ST. SIG.

Ground connected to lead G short circuits N and closes motor magnet MM. Relay N restores and opens F, A, B5 or B6, and #2 K and #2 J. Motor magnet MM operates, prepares to step the wipers of the DISTRIBUTOR one step, and operates the INT. springs. The INT. springs, when operated, open the circuit from the G lead over contacts of B to the motor magnet MM which restores. Relay F restores, opens #1 K, #1 P, and #1 J, and removes ground from lead T. ST.

Relay A restores. Relay B5 or B6 restores, removes #2 D5 or D6 from the line, connects a multiple ground on lead G, opens all control circuits between this Finder and the group relays. Relay K (or J) restores. Relay P restores and removes ground from lead P. C. METER.

The motor magnet advances the wipers of the DISTRIBUTOR one step to the contacts associated with the next Finder and extends lead G over the now closed INT. springs to its own winding. If the next finder is busy, the LEV. "A" wiper of the Distributor finds ground on lead G of the finder. This ground operates motor magnet MM and short circuits at the same time N to prevent its operation should relay C operate due to another call being made before the Distributor has found a free Finder. Motor magnet MM steps the wipers to the next Finder. If this Finder is also busy, the circuit is again closed to motor magnet MM, and the above sequence repeated.

When an idle Finder is found by the distributor, the circuit is no longer closed to motor magnet MM, and there is an absence of ground on N, thus allowing it to reoperate if there is another call waiting.

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Should there be more than one subscriber's line relay holding ground on the START lead, relay C remains operated, and the sequence when one of the lines is found is the same as previously described.

1.7 Releasing (Operated: Relays CO, A5 or A6 (or D5 or D6))

When the succeeding selector restores, ground is removed from lead C to the selector, which opens A5 or A6 (or D5 or D6) and CO in series.

Relay A5 or A6 (or D5 or D6) restores, closes the RLS. magnet and G in series, and opens the "+", "-", and C links. Relay CO restores and connects the line relay L to the line. The CN lead of the line circuit becomes unguarded and ready to receive incoming calls. Relay G operates and grounds lead RLS-A (or RLS. LP.). The RLS. magnet operates and restores the shaft and the wipers to normal. The V.O.N. springs operate, remove ground from lead G, marking this Finder idle to the associated group relays, connect multiple ground to lead ATB. GRD., connect lead C to A5 or A6, and open the RLS. magnet and G.

The RLS. magnet restores. Relay G restores and opens the circuit to lead RLS-A (or RLS. LP.).

2. Special Operating Conditions

2.1 All Finders Busy

Relay B is normally held operated by ground from one or several idle Finders. When the last idle Finder of a group is operated, ground is removed from the ATB ground lead (jack 15L). Relay B remains operated by ground from N until the Finder has found the calling line. When N releases, B also releases. Relay B disconnects lead START A from C and connects it in multiple with lead START B. Therefore, all further calls from lines in group A cause the operation of relay group B and a finder in GRP. B as long as all finders in GRP. A are busy.

Relay B also opens the connection from GRP. B to the fifth vertical bank contact so that Finders of GRP. B can now step above the fifth level (as required for finding lines of GRP. A on the banks of GRP B finders). Relay B also opens a circuit to magnet MM of DISTRIBUTOR A to prevent it from searching for an idle Finder as long as no idle Finder is available. Relay B also prepares a circuit for an A.T.B. meter (if equipped). As soon as a Finder in the busy group is released, relay B is reoperated, and this group is automatically restored to service.

Lines in GRP. B are transferred in the same manner to GRP. A when all Finders in GRP. B are busy.

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When all Finders in both GRPS. A and B are busy, both relays B are released. The circuits to both relays C are opened so that any further call cannot operate a start relay. The circuit is closed to the ATB meter. Any call originated during this period must wait for a Finder to become idle. The calling party does not receive dial tone and either hangs up or waits until the receives dial tone. As soon as the Finder (in either group A or B) becomes idle, this Finder causes its associated group relays to be restored to service and immediately searches for any waiting call.

2.2 Finder Does Not Find Rotary Marking (Operated: Line relay L, relays A, B, C, F, N, P & B-5)

If the Finder fails to encounter battery through the subscriber's CO relay on a C wiper, the shaft and the wipers are rotated to the eleventh rotary position where the CAM SPCS. operate and close battery through lead TEST-1 to #1 K. Relay K operates, opens the rotary circuit to prevent further rotary action, and closes A5 or A6. Relay A5 or A6 operates, connects wipers "-", "+" and C to the succeeding switch, and places ground on lead G to complete a circuit to motor magnet MM. Motor magnet MM operates and opens N with its INT. springs. Relay N restores, opens F, A, P and B5 or B6 and restores motor magnet MM which steps its wipers to the next finder.

The condition just described is usually due to the calling party having hung up after a Finder has started but before the Finder has made connection with the calling line (release of relay L of the line circuit removes battery and CO relay from C-bank of Finder). The release of the line relay also releases start relay C, but after the rotary operation of a Finder has started, relay P keeps the circuit closed to F so that the rotary movement must be completed even if relay C releases during this period.

When a finder steps to the eleventh rotary contact, it is released as soon as B5 or B6 releases, as the loop circuit for relay A of the selector is not held operated over wipers "-" and "+" of the Finder.

When the Distributor has found another idle Finder and relay C is not operated, no further action takes place. However, if the failure to find the calling line was due to a trouble condition (circuit open to CO relay either in bank wiring or in the Finder first used), a new finder immediately starts to search for the calling line.

2.3 Finder Does Not Find Vertical Marking (Operated: Line relay L, relays A, B, C, F, N, & B5 or B6)

If the Finder fails to find the ground on the level on which the calling line appears, it continues and raises the shaft and wipers to the fifth level which is usually grounded by F (See Section 1.2) or to the tenth level (when group relays A or B are busy). The tenth level is always grounded. The Finder "cuts-in" on the grounded level and rotates to the eleventh rotary step as described in Section 2.2. The remaining operations are as described in Section 2.2.

2.4 Group Relay Transfer Timing Circuit

Relay F closes a circuit to a transfer timer by grounding lead T. ST. and connects #1 E to lead TIME-1 from the timer circuit.

Normally F is operated for a very short time, not more than half a second, as the operation of the Finder is very fast. The time pulses TIME-1 and TIME-2 used for timing the correct operation of the Finders are so spaced that they do not interfere with any normal condition. If, however, relay F remains continuously operated, this indicates an abnormal delay in finding a call which is probably the result of a trouble condition (in the group relays or the finders). In this case, the following operations result:

A ground pulse on lead TIME 1 closes E. Relay E operates, closes its locking circuit, and extends #1 D to lead TIME 2. Relay D operates (after an additional time interval), closes its locking circuit through its #2 winding to ground over lead ATB. GRD. B, closes L, opens lead ATB. GRD. A to open B, closes a circuit to motor magnet MM, and short circuits N. Relay L operates, locks from ground at key TRANS. RESET, and closes an alarm supervisory circuit which lights a supervisory lamp. Relay B releases, transferring the start lead to the other group relays as described in Section 2.1. Relay C releases, causing the release of all other operated relays except D.

The waiting call that has caused the timed transfer is now found by the other group.

The distributor is stepped off the Finder to which it is connected at the time D operates.

Relay D is held operated until all the Finders in the other group become busy or until manually released by momentarily operating the BUSY KEY or the TRANS. RESET key. Relay L remains operated until released by the manual operation of key TRANS. RESET, which opens D, if it is still operated. When relay D restores, B reoperates and transfers lead ST to GRP. A.

If all Finders of the other group should be busy at the moment D is operated D cannot lock itself as there is not ATB ground at its locking circuit. Therefore, it remains operated only as long as ground is connected to lead TIME 2. This, however, is sufficiently long to step the distributor to another Finder. If the trouble was due to one particular Finder, this brings another Finder into operation. When D releases at the end of pulse TIME 2, relay B reoperates, relay C reoperates, and the waiting call is again searched for by another finder.

Normally, a timed transfer causes a supervisory alarm over the circuit closed by L and a maintenance man investigates the alarm and restores the blocked group relays with service by operating the reset transfer key.

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3. Traffic Metering Facilities

If necessary traffic meters are equipped, the following traffic records can be obtained:

The circuit to a peg count meter is closed every time relay P is operated. Therefore, the peg count meter is operated once for ever call on which a Finder operates both vertically and horizontally. This is a record of total originated calls (it does not indicate whether calls are completed). Comparisons of peg count meter readings between various groups show variations in originating call load.

The release of B prepares an A.T.B. circuit. The meter circuit on the A.T.B. leads can be arranged to indicate either the number of times that an A.T.B. condition has existed (A.T.B. meter) or the number of times additional calls have been initiated during an A.T.B. condition (overflow meter). Either type of circuit gives a good indication of overload conditions.

4. Busy Keys

The BUSY KEY of the Linefinder, when operated, grounds lead G (thereby marking this switch busy). and removes a multiple ground from the ATB. GRD. lead. If the distributor should be standing on the bank contact leading to a Finder when this BUSY KEY is operated, the motor magnet operates and move the wipers ahead to another idle finder.

If the BUSY KEY is operated on the associated first Selector while a Finder is idle, relay A5 or A6 operates over the C-lead from the selector by ground placed on the C-lead by the BUSY KEY of the Selector. Relay A5 or A6 operates and produces the same result as if the BUSY KEY of the Linefinder has been operated. Therefore, an idle Linefinder can be made busy either by operating its own BUSY KEY or the BUSY KEY of an associated selector.

The BUSY KEY of the group relays when operated opens the circuit to relay B which, upon restoring, transfers the calls to the other group, and opens the locking circuit to D.

5. Test Jacks

When a finder is connected to a line, the two sets of wipers rest on the bank contacts of two lines, one in the upper bank, the other in the lower bank. The LOWER BANK test jack of the Finder, springs #10 and #11, is used to check to which line the operated finder is actually connected. If the lower bank wipers are in use, D5 or D6 is operated. In this case, short circuiting the LOWER BANK test jack grounds lead LBL and lights a supervisory lamp on the finder shelf. If the upper bank wipers are in use, relay D5 or D6 is not operated. In this case, short circuiting the jack does not light the lamp.

Calls can be monitored by connecting a test telephone to springs #8 and #9 of the test jack of a busy finder.

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The test jack of the group relays provides several routine test features: A short circuit between springs 1 and 2 operates the start relay C in the same manner as when a call is originated from a line but without placing a direct marking ground on any vertical bank contact. Relay C operates as on a regular call and starts the operation of an idle finder. This finder goes through the same operations as described in Section 2.2 and then releases. Another Finder then immediately starts. This operation continues until the short circuit is removed from jack springs 1 and 2. This routine test permits a rapid check of the vertical and rotary operations of each finder as one finder after another operates in rapid succession.

Springs 5 and 6 are normally connected to a line circuit. One line circuit in group A and one line circuit in group B are usually set aside as a test line for the respective group. When springs 5 and 6 are short circuited, the line relay operates, and a finder searches for the test line. This permits checking the complete correct operation of each finder. If a test telephone is connected to springs 5 and 6, it is also possible to check the associated selector for dial tone and to dial one or several digits to check the operation of the associated selector (removal of dial tone) and other succeeding switches.

Springs 3 and 4 of the test jack are for controlling the impulse and transfer circuits of the switch. A short placed across the spring energizes A continuously, and thus prevent impulsing from occurring. After the necessary time interval, transfer should occur as described in 3.4. The pulsing speed and ratio pulses from A can be checked by connecting a suitable speed and ratio meter across springs 3 and 4.

6. Supervisory Equipment

The RLS-A (or RLS-L.P.) lead is connected to a delayed alarm circuit. The supervisory lamp lights when the circuit to a Linefinder's RLS. magnet is closed for an excessively long time and indicates that a Finder has failed to release.

The ST. SIG. lead is grounded as long as start relay C is operated. This closes a delayed alarm circuit which causes an alarm and lights a supervisory lamp after some seconds. Normally, the start relay is not operated long enough to bring in such an alarm. This alarm indicates a condition of one or several calls waiting without getting service.

The F.B. lead closes an alarm circuit to indicated timed transfers. The alarm lamp remains lighted until the TRANS. RESET key is manually operated.

The LBL lead is connected to a supervisory lamp on each shelf to check whether lower or upper bank wipers are in use (see Section 5).

7. Normal Post Springs

Finders per FIG. 5B, 5C, 5G, 5H (with normal post springs) are required when it is desired to extend a ground over lead EC to the succeeding switch. This marking, in combination with a suitable 1st Selector or equivalent switch, may be used to restrict certain lines from access to certain trunk groups, or to control conversation timing on certain types of calls or

similar special features. The marking condition can be provided only on a per-level basis, for groups of 10 lines (FIG. 5C) or 20 lines (FIGS: 5B and 5G). The left normal post springs are adjusted to make on the levels where ground is to be placed on lead EC.

8.. Finders Used In Type a Satt System Exchanges

"D" wiring is provided with FIGS. 5D, E, and F for connecting resistance battery to the "+" line to pre-energize the "A" relay in the primary Selector; this prevents a false leakage test in the Director when a regular subscriber places a call requiring ticketing.

Finders per FIG: 5D are used on shelves serving only one "class of service" group of subscribers. Normal post springs are not required

Finders per FIG. 5E are equipped with left and right Normal Post Springs. Restricted service may be given in combination with a suitable primary selector on a per-level basis for groups of 20 lines. Any combination of different classes of service may be indicated. The associated primary selector is connected to provide the desired arrangement.

Finders per FIG. 5F provide restricted service on a per-level basis for groups of 10 lines. This Finder normally serves regular and restricted subscribers. The regular subscribers may be of any one class of service but all must be in the same class.

Prepay station lines require linefinders per FIG. 5A, B, or C. "C" wiring must be used on shelves serving pre-pay paystation lines to prevent false operation of the associated paystation repeaters. In the case of paystation lines, the leakage test is not used; paystations are restricted from dialing through channels requiring ticketing.

(18) JFS
(25) LME:jt