NO. 64-B-1 SELECTIVE CALLING ARRANGEMENT

1. GENERAL

1.01 The 64-B-1 selective calling arrangement consists of equipment to be associated with a number of private wire teletypewriter stations on a line to enable any station to start the teletypewriter motors at the other stations selectively, and to operate signals at the various stations. The following features are provided:

(1) A maximum of 42 stations on a line.

(2) A call is made by dialing a code.

(3) A guard signal indicates when a station is dialing or the line is open.

(4) The teletypewriter motor is started at the calling and called stations, and an audible signal, if provided, is operated at the called station.

(5) A busy lamp is lighted at all stations when the line is busy.

(6) All the stations on the line may be called simultaneously by dialing a special code. One or more predetermined groups of stations also may be called in the same manner by making slight changes in the connections.

(7) Any number of stations may be called by dialing their codes successively.

(8) After one or more stations have been called others may be added.

(9) The audible signal may be reoperated at any stations already called.

(10) The motors at all stations may be stopped and the circuit restored to normal by sending a "stop" signal.

(11) An error made in dialing the first digit of a code may be corrected.

(12) A privacy feature may be provided which will prevent any station not called from monitoring on a conversation.

(13) Each station teletypewriter may be tested locally without interfering with service at other stations.

2. DESCRIPTION

2.01 The selector unit consisting of the selector and associated relay equipment is housed in a wooden apparatus cabinet. The cabinet is provided with a lift panel, and the equipment is mounted on a gate which may be swung out from the cabinet.

2.02 The control unit contains the busy and guard lamps and the three keys used in operating the equipment. The control unit and dial are mounted on the teletypewriter table. An auxiliary busy lamp, and a buzzer to serve as an audible calling in signal may be provided if desired.

2.03 A 24-volt, KS-5454 rectifier is normally provided to supply operating current for the selector unit and signals. If a 24-volt battery is available capable of providing a current drain of about 1.25 amperes, this may be used instead of the rectifier.

2.04 Radio induction suppression equipment may be provided if required. The selector unit is wired for this equipment but not equipped with the apparatus unless so ordered. If necessary this apparatus can be easily added in the field. The suppression equipment consists of a dial filter, spark killers for the relays which operate most frequently, and retard coils in the leads to the control unit.

2.05 A schematic circuit of the 64-B-1 equipment is shown on Figure 1. This figure illustrates a typical case. For other arrangements and for a complete circuit description, reference should be made to the standard SD drawings and associated circuit description sheets.

64 - B - 1 SELECTIVE CALLING ARRANGEMENT

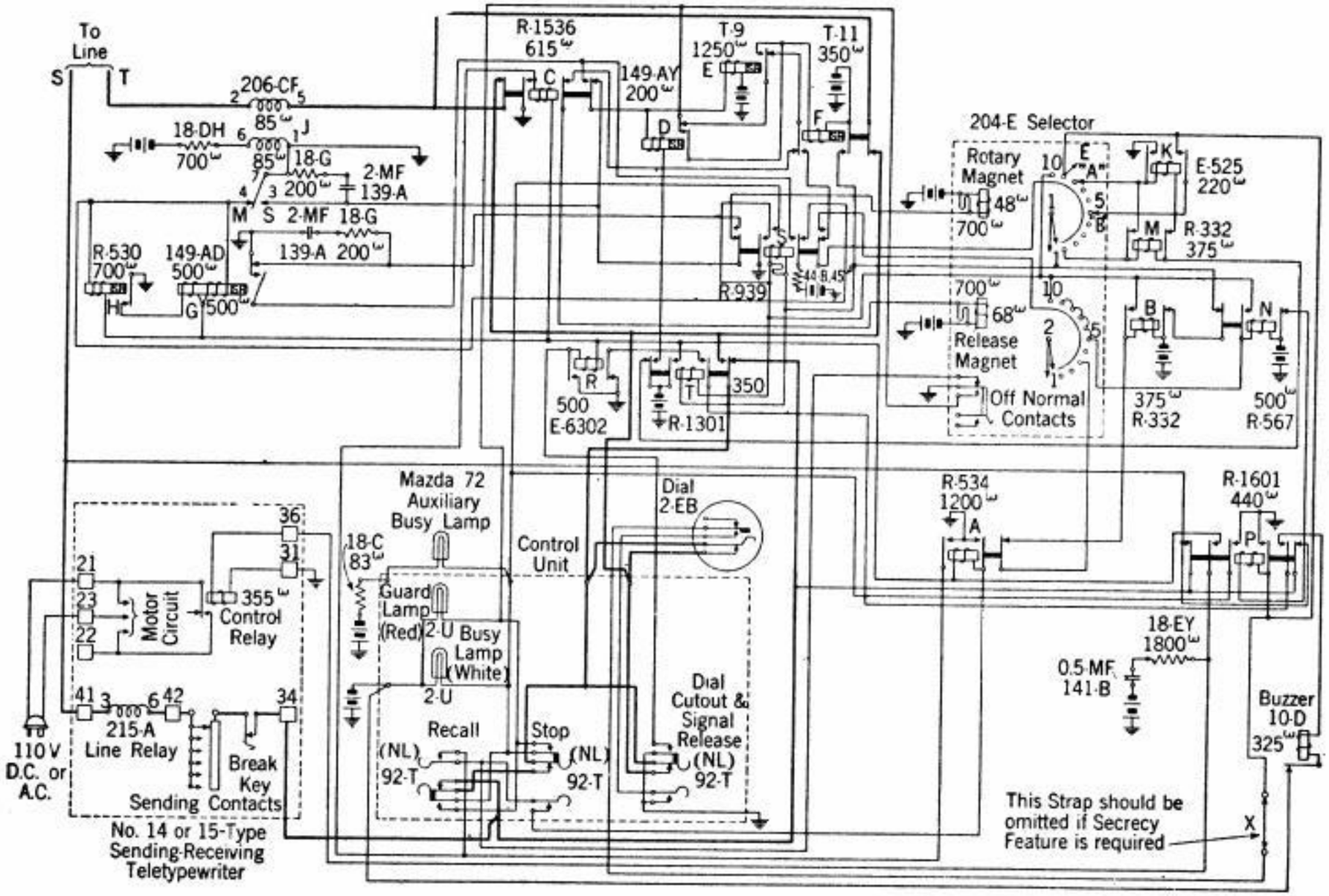


Fig. 1

NO. 64-B-I SELECTIVE CALLING ARRANGE-MENT

2.06 If a spare teletypewriter is provided, it may be equipped with a three-position switching key which, when operated in one direction causes the spare teletypewriter to replace the regular teletypewriter equipped with the selective calling arrangement. If there are two regular teletypewriters on different lines, the operation of the "spare" key in the other direction may be made to cause the spare machine to replace the other regular machine. The second regular teletypewriter may be either equipped with a selective calling arrangement or not. The operation of the key controls the operation of relays in the apparatus cabinet which do the actual switching.

2.07 An extra jack is mounted on the teletypewriter table into which the plug wired to the control relay of the teletypewriter may be inserted to start the teletypewriter for making local tests.

2.08 If it is desired to have certain stations on a circuit equipped to send but not to receive selective calling signals, it is only necessary to provide the following equipment at these stations.

One dial and mounting
One 6017-C key
One 60 type selector key per D-90991
One 60 type selector key case per D-81028

This apparatus should be connected as shown on Figure 2.

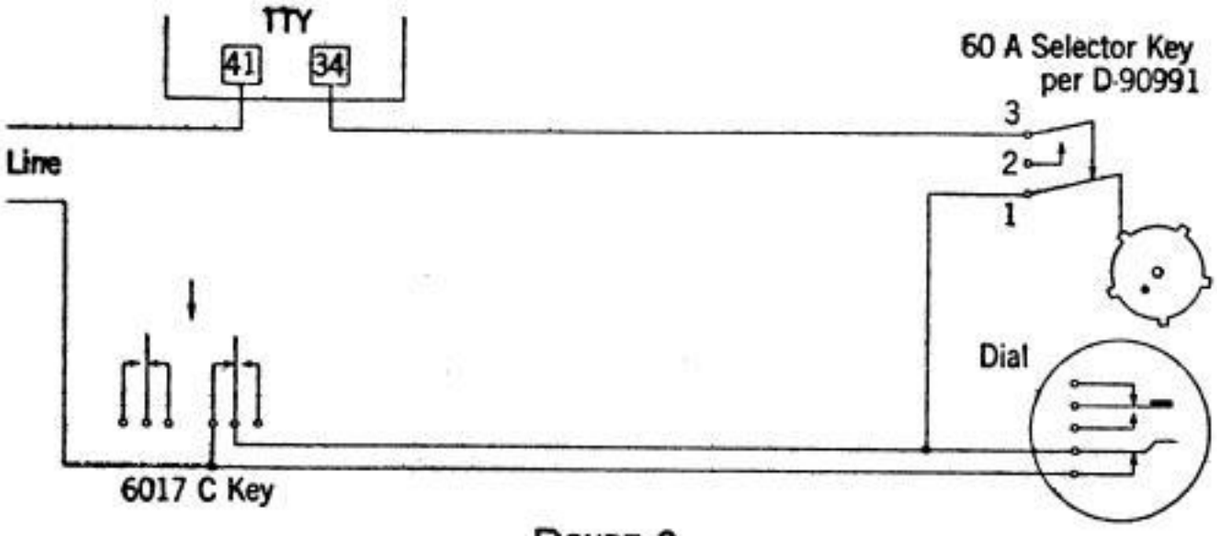


FIGURE 2

3. OPERATING METHODS

3.01 The equipment is operated as follows:

To Call:

(1) Observe that the BUSY lamp and GUARD lamp are not lighted.

(2) Depress the DIAL and RLS key and hold it while dialing.

(3) If a single station is desired, dial the code of that station, as "8-5-0." Wait for the GUARD lamp to go out before dialing the succeeding digit.

(4) If more than one station is desired "1" should be substituted for the "0" at the end of each code except the last which should end in "0." Example, "8-5-1-7-2-1-6-3-0."

(5) If the privacy feature is provided the code of the calling station must always be dialed in addition to that of the called stations in the same manner as described in (4).

(6) If all stations are desired, "9-0" should be dialed. In some cases the equipment is arranged so that a predetermined group may be called by dailing "8-0," "7-0," or a similar code. Each predetermined group in addition to the original "9-0" call will reduce the total number of individual station codes that are available.

To add stations: If after one or more stations have been called it is desired to add more stations, the RECALL key in the control unit should be operated momentarily. When the teletypewriter motor has stopped, dial the desired added station codes as previously described.

To answer a call: If an audible signal is provided, operate the DIAL and RLS key momentarily to retire the signal, answer by typing.

To reoperate the audible signal at the stations already called: Operate the RECALL key momentarily. When the teletypewriter motor has stopped, dial "0."

To restore the circuit to normal at the completion of a message: Operate the STOP key momentarily.

Dialing errors: If the first digit of a code is dialed incorrectly, dial "1," and then proceed to dial the correct code. If the second digit is dialed incorrectly, dial "0" and send a stop signal. Then dial the correct code.

3.02 At stations which are provided with calling and disconnect equipment only, as decribed in 2.08, the operating procedures are as follows:

To Call:

(1) Monitor on the circuit to determine that it is not busy.

(2) Depress the 6017-C key and hold it while dialing.

(3) Dial the proper code pausing for at least one second between digits.

To restore the circuit to normal at the completion of a message: Operate the 60 type selector key.

To add stations: As means for sending a recall signal are not provided, it will be necessary to proceed as follows:

(1) Restore the circuit to normal by operating the 60 type selector key.

(2) Dial all the stations desired including those previously called as described in 3.01.

3.03 Line hits may cause errors in dialing either due to a hit coming in during dialing, or by false partial selections being set up when the circuit is idle. In some cases where lines are subject to hits a routine is set up which provides for dialing the digit "1" immediately preceding each code. This clears out any false single digit partial selections which may have been set up.

4. INSTALLATION INFORMATION

4.01 The apparatus should be tested and adjusted, if necessary, to meet the standard requirements at the time of installation as outlined in Part 5. This may be done on the job or before transporting the equipment to the customers' premises.

4.02 The apparatus cabinet may be located in any convenient place, but preferably near the teletypewriter to reduce the length of cable run and to facilitate testing. The cabinet may be either floor or wall mounted. In deciding on its location and mounting, consideration should also be given to the accessibility of the equipment for maintenance purposes. The telegraph loop, rectifier output, and ground should be connected to the terminal strip in the cabinet in accordance with the circuit label. The "A" and "B" leads from the (M) and (K) relays should be soldered to the terminals of the

204E selector in accordance with the code assigned to the station. If a group call is to be provided a strap marked "E" on the circuit label should be connected as specified. A strap designated "X" on the circuit label is provided on the terminal strip of the selector unit if the secrecy feature is not required. If the equipment is to be operated from a battery the load equalizing (F) resistance is not required, and the circuit should be left open at this point.

4.03 In the assignment of station codes, any number may be used for the first digit except 1, 9, 0, or any number which may have been assigned for group calls. Any number may be assigned for the second digit of the station code except the one which has been chosen for the first digit, 1, 9, 0, or any number assigned for group calls.

4.04 The connections between the selector unit terminal strip and the terminals of the control unit, dial, teletypewriter, and teletypewriter motor control relay are shown on the circuit label..

4.05 The rectifier normally used with the equipment may be located in any convenient place, preferably near the apparatus cabinet. It may be either floor or wall mounted or mounted on the top of the cabinet. If practicable the power circuit from which the rectifier is operated should be the same as that provided for the teletypewriter and in any case care should be taken to insure freedom from interruption caused by other apparatus on the same circuit.

4.06 If radio induction suppression equipment is provided, two mounting plates of coils and condensers are added in the cabinet as well as resistances and condensers added in locations reserved on the four original mounting plates. Wiring is provided for this additional equipment in the original form. A dial filter is added, and the teletypewriter itself should be equipped with the proper filter. The leads from the control unit to the apparatus cabinet should be in lead covered cable and the cable sheath should be grounded.

DIAL AND CONTROL BOX
MOUNTED ON 15-A TABLE

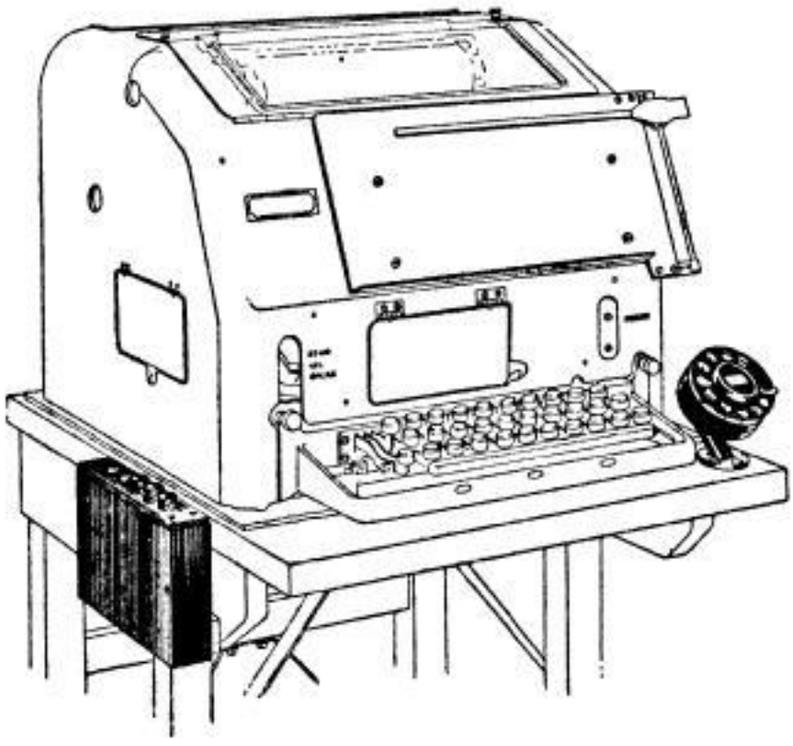
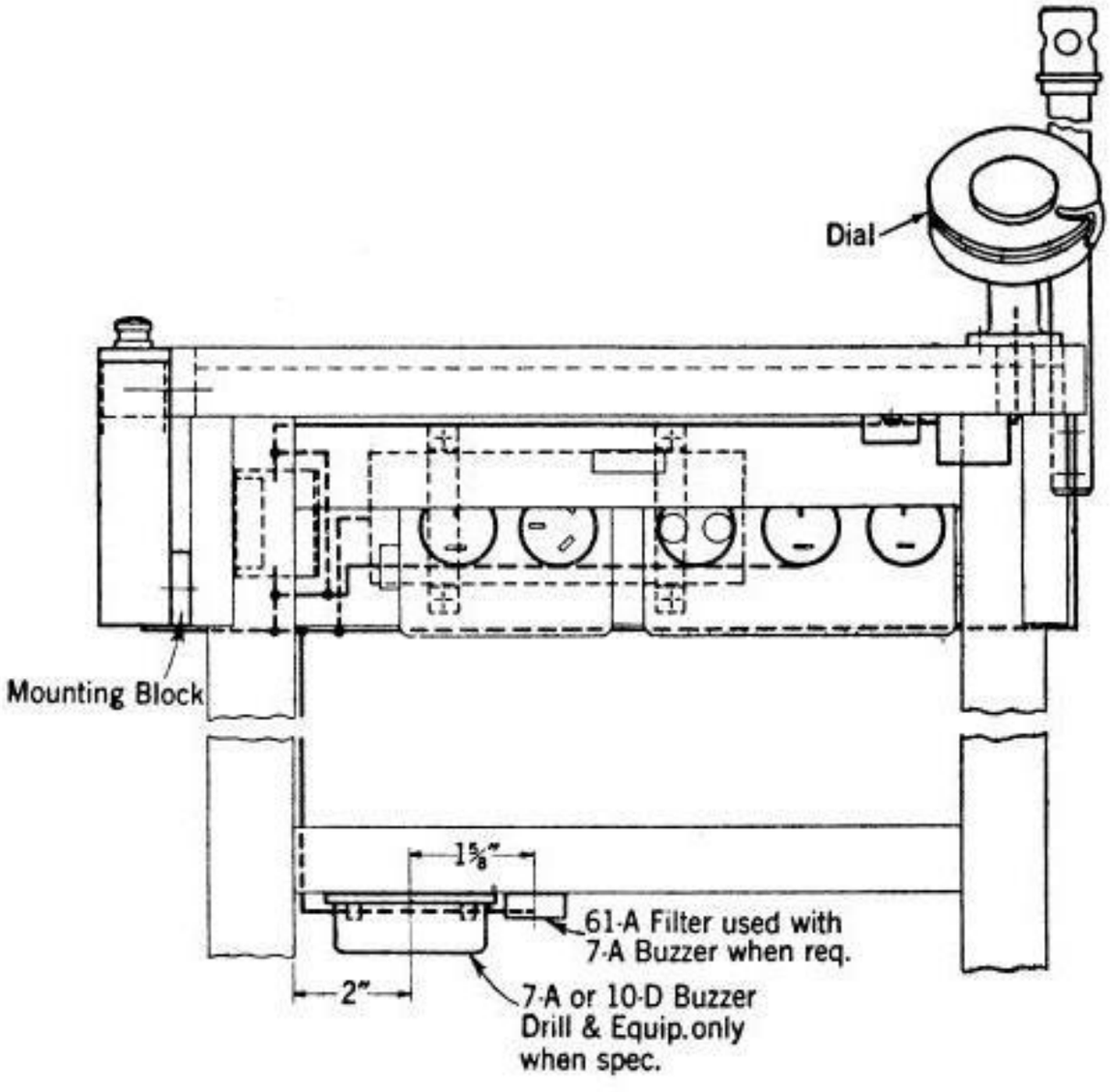


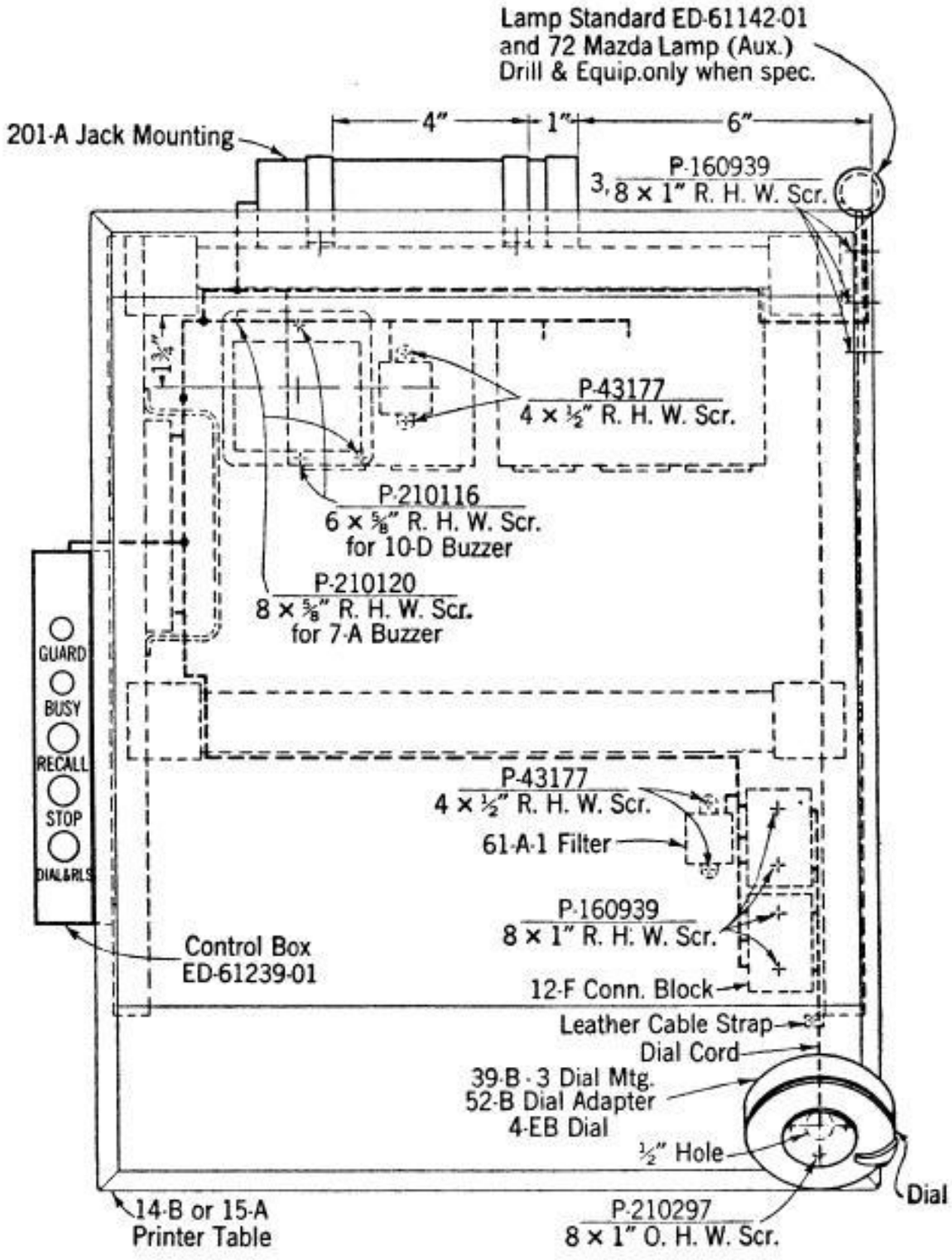
Fig. 3

4.07 A view of the dial and control unit in place is shown in Figure 3. Figures 4 and 5 show the method of mounting the dial and control unit on the teletypewriter table and Figure 6 shows the method of mounting the transfer key on the spare teletypewriter table. Although the figures show the equipment mounted on a 14-B or 15-A table, the same general arrangements would be used with the 15-N table.



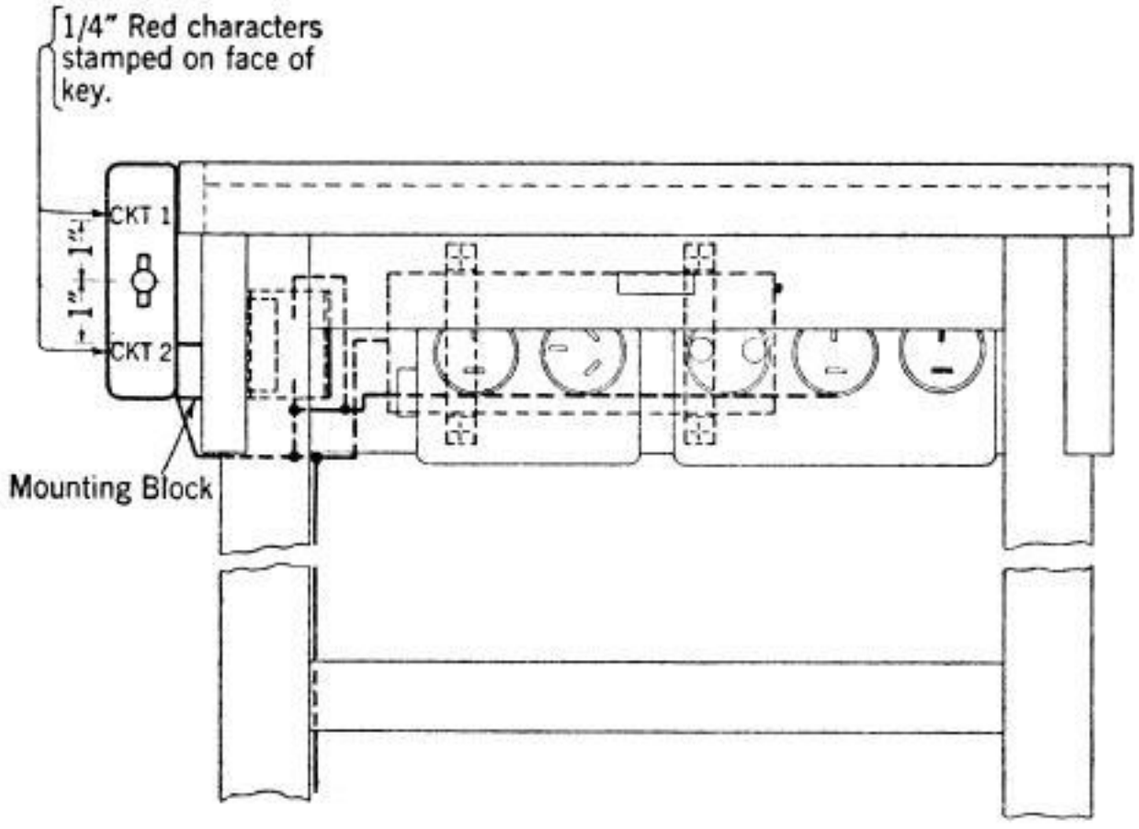
Front View of Regular TTY Table

Fig. 4



Plan View

FIGURE 5



Front View of Spare TTY Table

FIGURE 6

4.08 At stations which are equipped only to send selective calling signals the dial should be mounted as described in paragraph 4.07. The 60 type selector key per D-90991 and the 6017-C key may be mounted on the teletypewriter table in a convenient location by means of wood screws. Figure 2 shows the method of connecting the apparatus to the teletypewriter and the line.

4.09 When the equipment at a station is installed and connected into the line it should be given an operating test as follows:

(1) Dial the code which has been assigned to the station as described in Part 3.

If the secrecy feature is not provided the "P" relay should operate and lock as soon as the dial is moved off normal.

Note that the "K" relay operates and locks when the first digit is dialed.

If the secrecy feature is provided the "P" relay should operate when the second digit is dialed.

When the final "0" is dialed the teletypewriter motor should start.

(2) Depress the recall key momentarily. The selector should step ahead three steps causing the teletypewriter motor to stop, but leaving the busy lamp lighted.

(3) Dial "0." The teletypewriter motor should start.

(4) Depress the stop key momentarily. The selector should step ahead 5 steps causing the teletypewriter motor to stop and the circuit to be restored to normal.

4.10 When all the stations on the circuit have been installed and connected into the line the following tests should be made at each station.

(1) Dial one other station on the circuit, preferably the most distant as described in Part 3. Verify that the teletypewriter at the distant station and at the station from which the test is made has started.

(2) Send a recall signal.

(3) When the teletypewriter motor has stopped dial "0." Verify that the teletypewriter motors at both stations have started and that the motor at the distant station stopped upon receipt of the recall signal, leaving the busy lamp lighted.

(4) Arrange for a stop signal to be sent from the distant station and to have your station called from that station.

(5) Send a stop signal.

(6) Dial "90." Determine that the motors at all stations have started.

(7) Arrange to have any station at which the motor does not stop notify you and then send a stop signal.

5. ADJUSTING REQUIREMENTS

5.01 Paper separators per KS-7246 should be applied to the cores of the (E) and (F) relays in accordance with Bell System Practices.

5.02 All the relays and the 204E selector should be adjusted to meet the circuit requirements given in Tables 1 and 2. The methods of making the adjustments are given in the Bell System Practices of the A or B series covering the various items of equipment. In order to insure the best adjustment of the relays it is desirable to employ a relay timing test set.

5.03 If a relay timing test set is not available, the tension of all the springs of the (E) relay should be adjusted to lie between 9 and 15 grams. If necessary to meet the operating requirements of the circuit the tension of the bottom

springs of this relay may be made less as required. To test the adjustment of the relay, the digit "2" shoud be dialed a number of times as rapidly as possible, at the same time observing the selector. It should not be possible to dial the digit the second time before the selector has released. Now dial "0." The (E) relay should operate sufficiently promptly so that the selector does not miss a pulse.

6. MAINTENANCE

6.01 The 204E selector should be lubricated at intervals. An interval of 3 months is suggested. This may be extended if experience indicates that due to local conditions adequate lubrication is maintained over the extended interval.

6.02 To insure that the 204E selector wiper assembly remains tight, it should be inspected at intervals. The wiper tips should be inspected to insure that they are aligned and pass approximately over the center of each bank contact. When the springs are aligned the mounting nuts should be tightened securely.

6.03 No routine tests or inspections of the equipment except as covered in 6.01 and 6.02 should be required. When it is necessary to readjust any of the equipment to correct a trouble condition, the adjusting requirements given in Part 5 should be met, and the equipment given a thorough operating test as described in paragraph 4.10.

CIRCUIT REQUIREMENTS

64-B-1 SELECTOR CIRCUIT (64-B-1 TTY. SEL.)

APPARATUS		MECH. REQ.			CIRCUIT PREPARATION				TEST SET PREP.	SEE TEST NOTE NO.	DIRECT CURRENT FLOW REQ.					REMARKS
DESIG.	CODE	BSP FIG.	CONT. PRESS.	ARM. TRVL	SEQ. SW. POS.	BLOCK	TEST CLIP DATA CONN. BAT.	TEST CLIP DATA CONN. GRD.			TEST WDG.	TEST FOR	AFTER SOAK AMP.	TEST AMP.	READJ. AMP.	
FIG. 1																
MAGNETS																
A	204-E							6T (S)	GRD.	1/3/5	ROT.	O		.330	.300	Insulate 6T (S)
	SEL.					(C) O		1T (C)	GRD.	2/3/5	RLS.	O		.165	.150	
RELAYS																
A	R-534	10/1	H	.015		(T) O		RT (A)	GRD.	5		O		.015	.010	Insulate 1T (A)
B	R-332	2/1	H	.015				RT (B)	GRD.	5		O		.0132	.0125	Insulate 4T (N)
C	R-1536	7/10	H	.020		(T) O		RT (C)	GRD.	5		O		.029	.0195	Insulate 1B (C)
D	149-AY	C				(C) O	T (D)	B (D)	B/G	7		O	.100	.036	.034	
						(C) O	T (D)	B (D)	B/G	7		R	.100	O.C.	O.C.	
E	T 9	3/1	L	.020		(C) O		RT (E)	GRD.	5/7		O		.0095	.009	
						(C) O		RT (E)	GRD.	5/7		H		.0048	.0045	
F	T 11	10/3	H	.020				RT (F)	GRD.	5/7		O		.0225	.021	
G	149-AD	A									P	O		.0225		Req. for Rel. Wdg. alone
						(H) NO	RB (H)	RT (H)	B/G		P	O		.0405		Req. for Par. Comb. with Rel. (H). Ins. 3B (S)
						(H) O	RB (H)		BAT.		S	O		.0225	.021	Insulate 3B (S) & Block (J) O to Cont. 3
						(H) O	RB (H)		BAT.		S	R		.0023	.0025	
						(T) O		RT (H)	GRD.	6/7						
H	R-530	1	H	.015						7		O		.0147	.014	Req. for Rel. Wdg. alone
										7		NO		.0085	.009	
							RB (H)	RT (H)	B/G	4		O		.038	.036	Req. for Par. Comb. with Rel. (G) Ins. 3B (S)
							RB (H)	RT (H)	B/G	4		NO		.019	.020	

TABLE 1
From Drawing SD-63869-012 Issue 6

TEST NOTES:

1 Rot. Magnet shall Step the Wiper One Complete Step
2 Move Sel. Off Normal before Testing (RLS) Magnet
3 Refer to BSP
4 Insulate 1T (H)
5 The Ground Terminal of the 35C Test Set shall be connected to the + side of the 24 V. Power Supply or Signal Ground where Rectifier is not used
6 For Timing Test of (G) and (H) Comb.
7 If a Rel. Timing Test Set is available the Rels. should be adjusted to meet the following Timing Req. With a current as indicated flowing through the Rel. Under Test the Rel. should remain Operated over the Holding Time and Release within the Releasing Time

RELAY	OPERATE CUR. AMPS.	HLD. TIME SEC.	RELEASING TIME SEC.
D	.095	.250	.500
E	.015	.100	.200
F	.054	.100	.200
H	.027	.050	.080
G & H COMB.	.065	.250	.333

APPARATUS		MECH. REQ.			CIRCUIT PREPARATION			TEST SET PREP.	SEE TEST NOTE NO.	DIRECT CURRENT FLOW REQ.					REMARKS
DESIG.	CODE	BSP FIG.	CONT. PRESS.	ARM. TRVL.	SEQ. SW. POS.	BLOCK	TEST SET PREP. CONN. BAT.	TEST SET PREP. CONN. GRD.			TEST WDG.	TEST FOR	AFTER SOAK AMP.	TEST AMP.	READJ. AMP.	
J	206-CF	10				(C) and (F) O	5 (J)	2 (J)	NGB	4	P1	O	−.032	.011	.0096	Disconnect Lead from 1 (J)
							5 (J)	2 (J)	NGB	4	P1	NO	−.032	.002	.0025	
							6 (J)	1 (J)	NGB	4	P2	O	−.032	.011		
							6 (J)	1 (J)	NGB	4	P2	NO	−.032	.002		
K	E-525	1/1	H	.015			RB (K)	RT (K)	B/G			O		.021	.020	Insulate 2T (M)
M	R-332	2/1	H	.015				RT (M)	GRD.	5		O		.0132	.0125	
N	R-567	10/2	H	.015				RT (N)	GRD.	5		O		.016	.015	Insulate 1T (B)
P	R-1601	26/26	H	.030		(N) O	RB (P)	RT (P)	B/G			O		.038	.033	
R	E-6302	2/1	H	.015			RB (R)	RT (R)	B/G			O		.033	.013	Insulate 3B (S) & Block (J) O to Cont. 3
S	R-939	29/24	H	.025								O		.0655	.062	Req. for Rel. Wdg. alone
							RB (T)	RT (T)	B/G	2		O		.115	.105	Req. for Parallel Comb. with Rel. (T)
T	R-1301	8/8	H	.020								O		.034	.032	Req. for Rel. Wdg. alone
							RB (T)	RT (T)	B/G	2		O		.105	.095	Req. for Parallel Comb. with Rel. (S)
FIG. 4 MAGNETS																
A	10-D BUZ.									1						
FIGS. 4-A & 4-B																
A	7-A BUZ.									1						
FIG. 20 RELAYS																
SP	R-45	24/8	H	.025				RT (SP)	GRD.	5		O		.0285	.027	
FIG. 20-A RELAYS																
SP2	R-45	24/8	H	.025				RT (SP1)	GRD.	5		O		.0285	.027	

TABLE 2
From Drawing SD-63869-012 Issue - 6

TEST NOTES:

1 Adjust in accordance with BSP

2 Insulate 1T (B)

3 Prior to Issue 4-D the Current Flow Requirements for Relay 206-CF (J) were:

Test Wdg. P1 Operate	.0021 Amp.
Readj. Wdg. P1 Operate	.002 Amp.
Test Wdg. P2 Operate	.0021 Amp.
Readj. Wdg. P2 Operate	.002 Amp.

4 A negative sign (−) preceding a Current Value indicates that This Current shall flow in a direction opposite to the direction of the Circuit Operating Current.

5 The Ground Terminal of the 35C Test Set shall be connected to the + side of the 24 V. Power Supply or Signal Ground where Rectifier is not used.