BELL CANADA STATION INSTALLATION & REPAIR MANUAL SECTION : IX - DIALS

BSP = Bell System Practices
NTP = Northern Telecom Practices

BSP (AT&T) : 501-162-101 (1967) Type 9 Pulse Dial
Page 1169

NTP : 501-1631-500 (1975) Type QDB1 Pulse Dial
Page 1175

BSP (Bell Canada) : 501-164-105CA (1966) Type 25 Touch Tone Dial - Page 1181

BSP (Bell Canada) : 501-164-115CA (1970) Type 35 Touch Tone Dial - Page 1189

NTP : 501-1641-115 (1974) Type NE-35Q Digitone Dial
Page 1205

NTP : 501-1681-200 (1979) Type 35Q & QDC3 Digipulse Dials Page 1225

(OCR Applied - Document is Searchable)

STATION DIALS
9-TYPE
IDENTIFICATION AND MAINTENANCE

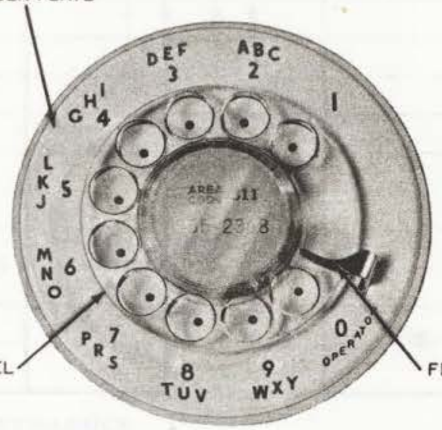

Fig. 1 — 9-Type Dial, Front View

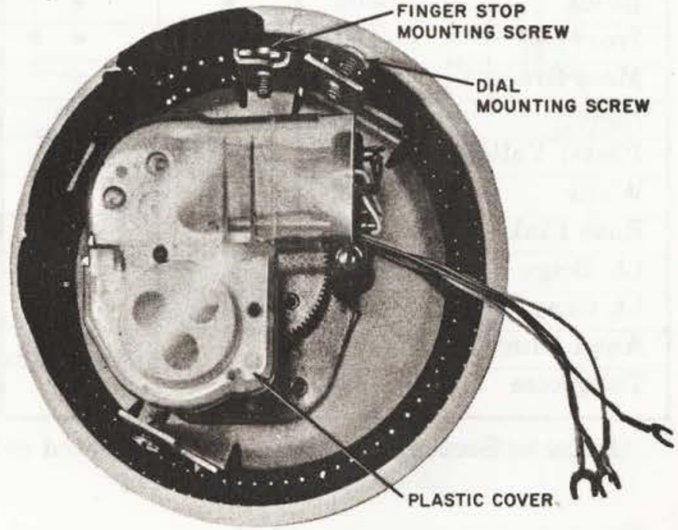

Fig. 2 — 9-Type Dial, Rear View

1. GENERAL

1.01 This section is reissued to:

- Revise illustrations
- Revise text

2. PURPOSE

To provide a direct replacement for 7-type dials.

3. ORDERING GUIDE

- Refer to Table A for components

TABLE A*
COMPONENT ORDERING GUIDE

REPLACEABLE COMPONENTS	DIAL						
	9C	9H	9K	9L	9M	9N	9P
Cover, Plastic	P-11E300	P-11E300	P-11E300	P-11E300	P-11E300	P-21F157	P-11E300
Plate, Clamp	P-44E348	P-44E348	P-44E348	P-44E348	P-44E348	P-44E348	P-44E348
Plate, Number	P-82D400†	P-82D400†	P-82D500†	P-82D600†	P-82D400†	P-83D400†	P-82D400†
Stop, Finger	P-44E351	P-44E351	P-44E351	P-44E351	P-44E351	P-44E351	P-44E351
Wheel, Finger	P-11E007	P-11E007	P-11E007	P-11E007	P-11E007	P-11E007	P-11E007

*Refer to Table B for color selection.
†Add suffix for desired color.

4. COLOR

TABLE B

COLOR ORDERING GUIDE*

COLOR		DIAL						
		9C-	9H-	9K-	9L-	9M-	9N-	9P-
Black	—03	•	•	•	•	•	•	•
Ivory	—50	•	•					
Moss Green	—51	•	•					
Red	—53	•	•					
Pastel Yellow	—56	•	•					
White	—58	•	•	•			•	
Rose Pink	—59	•	•					
Lt. Beige	—60	•	•					
Lt. Gray	—61	•	•				•	
Aqua Blue	—62	•	•					
Turquoise	—64	•	•					

*Refer to Section 500-120-100 for promoted colors.

5. APPLICATION

TABLE C

DIAL	SCHEMATIC FIG.	PULSES PER SECOND	REPLACES	USE
9C	3A	10	7A, 7C, 7D	General station sets. With colored sets or illuminated dial sets designed for 2-post mounting.
9H	3B	10	7E, 7G, 7H	Has two pair of off-normal contacts designed for speaker-phone systems. Also used on 532-, 533-, 535-, and 536-type telephone sets.
9K	3B	10	7K	Modular telephone panels
9L	3B	10	7L	Data set 101A. 691A subscriber set.
9M	3A	10	—	525-type telephone sets.
9N	3B	10	—	568N telephone set. 817A1 data auxiliary set.
9P	3C	10	—	529B telephone set.

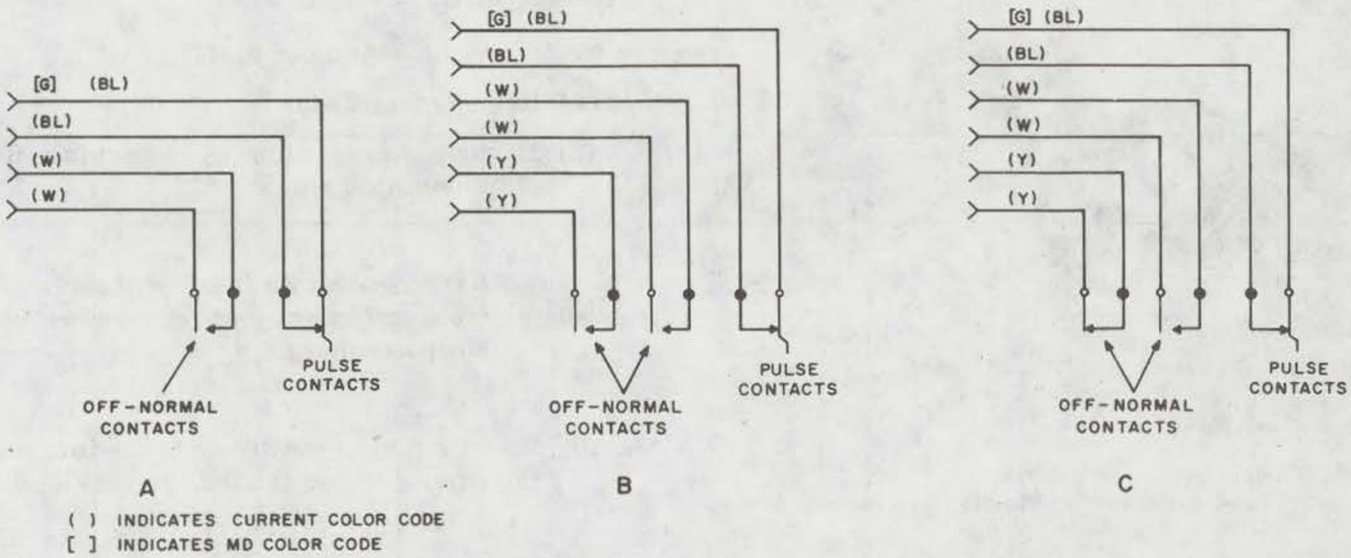

Fig. 3 — Dial Contact Schematics

6. MAINTENANCE

(a) Replaceable Apparatus (Refer to Identification Section for ordering guide and color)

- Finger Stop
- Fingerwheel
- Number Plate
- Plastic Cover

(b) Parts of the dial shall not be broken or missing.

(c) The finger stop shall not be loose or damaged.

- With the dial in its unoperated position, the finger stop shall not overlap the "0" hole by more than 1/32-inch.

(d) The dial shall operate smoothly without slipping or skipping.

(1) Check by operating dial several times.

- Replace dial if it fails in this requirement or is suspected of giving wrong numbers.
- Replace dial if improper dial speed or gear mesh is suspected.

(e) Do not lubricate any part of the dial.

(f) Exterior parts of the dial should be wiped with a dry KS-2423 cloth.

(g) Clean number plate with a damp KS-2423 cloth.

- If number plate cannot be cleaned or is marred or chipped, replace (see 6.03).

PLASTIC FINGERWHEEL

6.01 To remove fingerwheel:

(1) Rotate fingerwheel as far as possible in clockwise direction.

(2) Insert KS-16750, List 2 releaser into small hole located in edge of raised center of fingerwheel (Fig. 4) and push down to disengage the fingerwheel clamp spring.

(3) When clamp spring releases, remove fingerwheel.

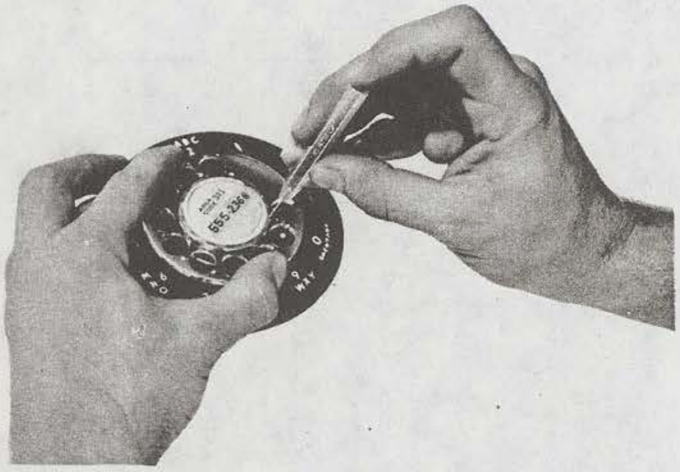

Fig. 4 — Removing Plastic Fingerwheel

6.02 To replace fingerwheel:

(1) Place fingerwheel over clamp with "0" hole directly over digit 9, making sure fingerwheel depressions are properly positioned on prongs of clamp plate.

(2) Rotate fingerwheel in counterclockwise direction until clamp spring snaps into notch on underside of fingerwheel (Fig. 5).

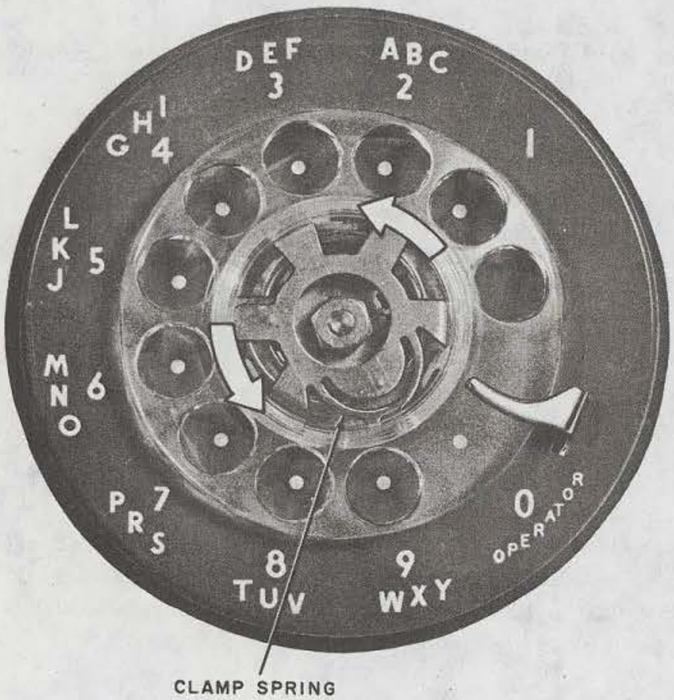

Fig. 5 — Replacing Plastic Fingerwheel

NUMBER PLATE

6.03 To remove number plate:

(1) Remove fingerwheel (see 6.01).

(2) Remove finger stop by loosening finger stop mounting screw.

THINK ***Exercise caution to prevent screwdriver from slipping and damaging clamp plate assembly.***

(3) Insert tip of screwdriver blade into one of the three slots on the lock ring (Fig. 6).

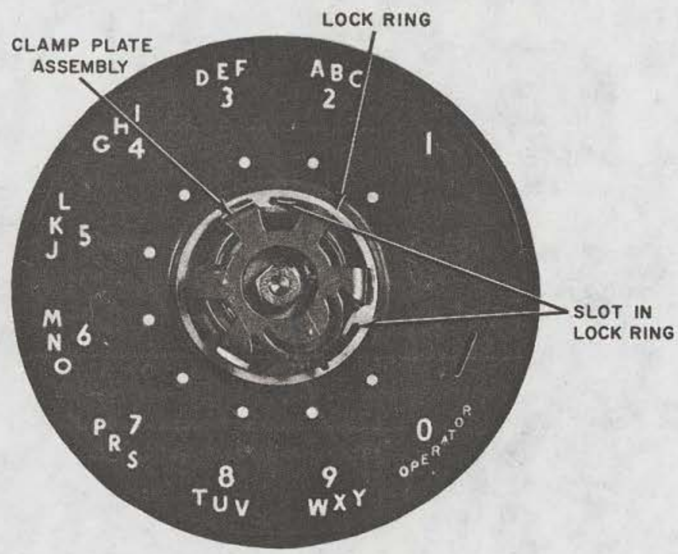

Fig. 6 — Fingerwheel and Finger Stop Removed to Show Lock Ring

(4) Rotate lock ring as shown in Fig. 7 until it is free.

(5) Raise lock ring until it is just under the clamp plate and slide toward the numeral 4 until the upper end of the ring can be lifted over the clamp plate (Fig. 8). Slide ring toward numeral 9 to remove.

(6) Lift off number plate.

6.04 To replace number plate:

(1) Reverse procedures in 6.03.

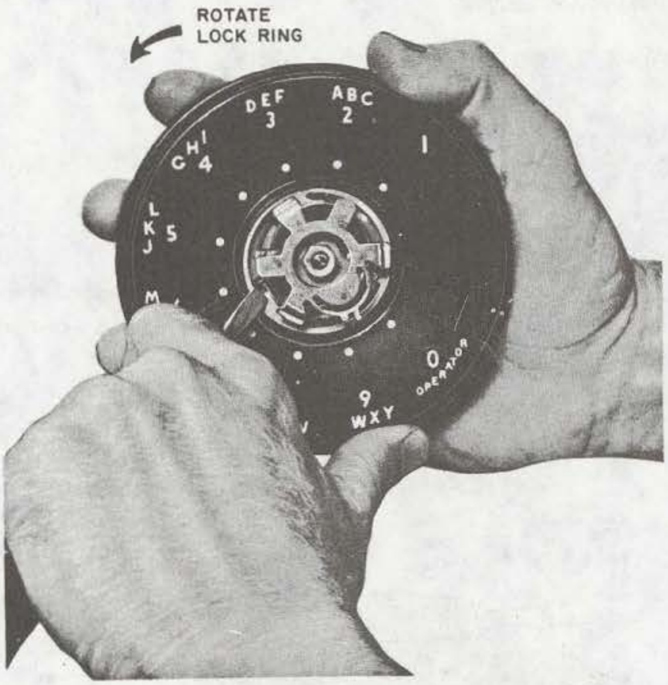

Fig. 7 — Lock Ring Removal

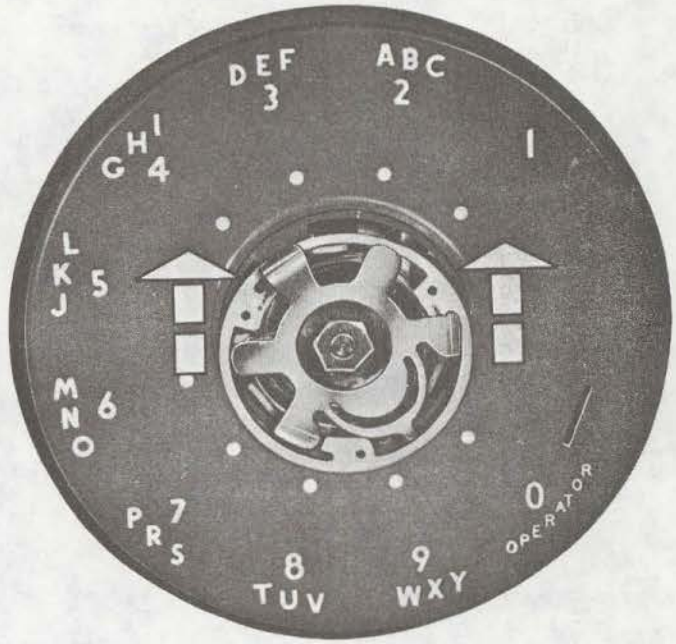

Fig. 8 — Lock Ring in Extreme Forward Position for Removal

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STATION DIALS

QDB1-TYPE

IDENTIFICATION AND MAINTENANCE

(a) QDB1A

(b) QDB1M

Fig. 1 — QDB1-Type Dials

1. GENERAL

1.01 This section is issued to replace earlier Northern Electric Procedures and to add information on newer QDB1-type dials.

2. DESCRIPTION

2.01 The QDB1-type dials use plastic gears, plastic bearings, and a sound-deadening ring around the governor to make the operation smoother, quieter, and more reliable than the NE-7 type dials.

2.02 The fingerwheels for the QDB1-type dials have two features not found on previous plastic fingerwheels.

- A longer, more prominent tab to assist in correctly positioning the station number card.
- A small hole, between finger holes 3 and 4 for removing the number card with an NS-16750L3 releaser.

2.03 Some of the QDB1-type dials are direct replacements, both physically and electrically for NE-7 type dials (Table A).

2.04 With the exception of the fingerwheel (P097M849) none of the replaceable parts of the QDB1-type dials are interchangeable with those parts of the NE-7 type dial.

2.05 Table B lists the available colors for QDB1-type dials.

TABLE A
IDENTIFICATION – QDB1-TYPE DIALS

DIAL	PULSING RATE (pps)	PERCENT BREAK	CONTACT ARRANGEMENT	REPLACES	APPLICATION
QDB1A	10 ± 0.5	62 ± 2	Fig.3(a)	NE-7C NE-7D	General station use.
QDB1B	10 ± 0.5	62 ± 2	Fig.3(b)	NE-7G NE-7H	Used in telephone sets for use with handsfree or key telephone systems.
QDB1C	10 ± 0.5	62 ± 2	Fig.3(a)	NE-7CQ1A NE-7DQ1A	Same as QDB1A except number plate has only numerals, used in QSK300A,B,F,G.
QDB1D	10 ± 0.5	62 ± 2	Fig.3(b)	NE-7QA	Same as QDB1B except number plate has only numerals.
QDB1E	10 ± 0.5	62 ± 2	Fig.3(c)	NE-7DQ3A	200 ms delay between digits instead of 100 ms.
QDB1G	10 ± 0.5	62 ± 2	Fig.3(a)	NE-7QH	Same as QDB1A except number plate has Arabic and English numerals 1 to 0.
QDB1H	10 ± 0.5	62 ± 2	Fig.3(c)	–	Same as QDB1E except number plate has Arabic and English numerals 1 to 0.
QDB1J	20 ± 1	64 ± 2	Fig.3(a)	NE-7QE	Number plate has Arabic and English numerals.
QDB1K	20 ± 1	64 ± 2	Fig.3(a)	NE-7QJ	Number plate has only numerals.
QDB1K1	18 ± 1	64 ± 2	Fig.3(a)	–	Same as QDB1K except pulsing rate is 18 pps, used in QSK301A.
QDB1L	10 ± 0.5	62 ± 2	Fig.3(a)	–	Number plate is 3.26 in. diameter with aiming dots only.
QDB1M	10 ± 0.5	62 ± 2	Fig.3(c)	–	Used on CENTURION coin telephones.
QDB1N	10 ± 0.5	62 ± 2	Fig.3(b)	–	Used in LOGIC telephone sets.
QDB1P	10 ± 0.5	62 ± 2	Fig.3(c)	–	Number plate has dots only, used in QSD300-type panel coin telephone sets.
QDB1R	10 ± 0.5	60 ± 2	Fig.3(a)	–	All numeral number plate used in QSK300C

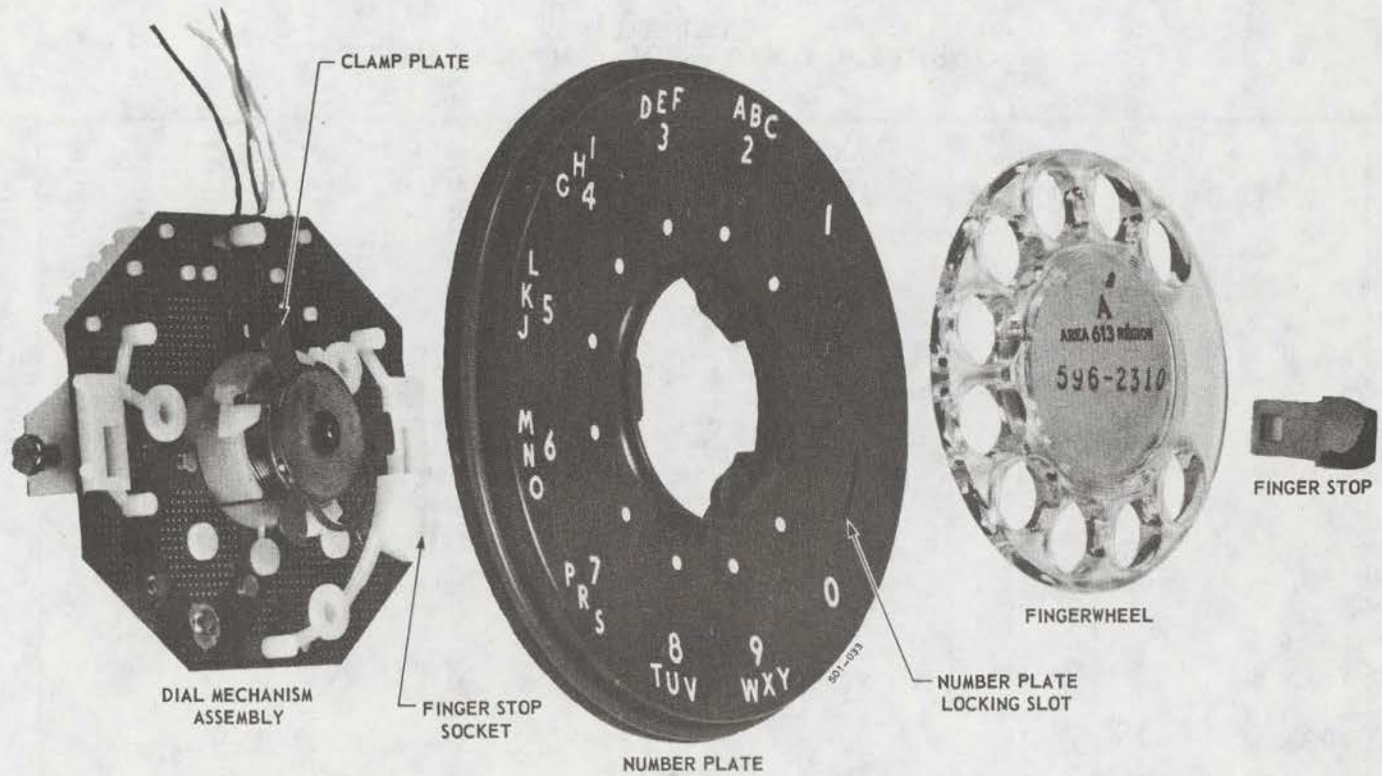

Fig. 2 — Assembly of Parts — Typical QDB1-Type Dial

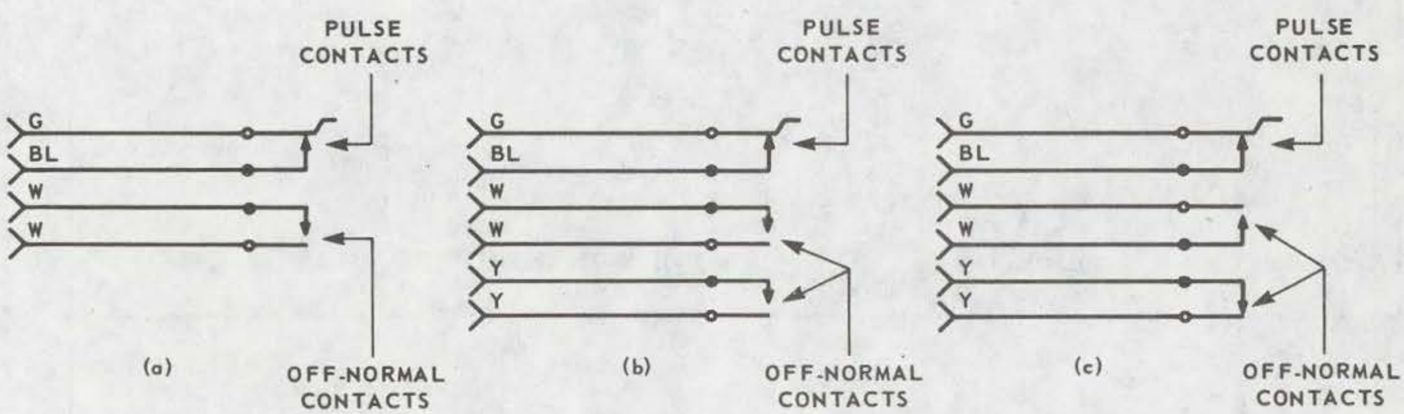

Fig. 3 — Dial Contact Arrangement

TABLE B
QDB1-TYPE DIALS - COLOR AVAILABILITY

COLOR	SUFFIX	QDB1A	QDB1B	QDB1C	QDB1D	QDB1E	QDB1G	QDB1H	QDB1J	QDB1K	QDB1K1	QDB1L	QDB1M	QDB1N	QDB1P	QDB1R
Black	-03	√	√	√	√	√	√	√	√	√	√	√		*		√
Ivory	-50	√	√	√	√	√	√	√	√	√	√	√				√
Green	-51	√	√	√	√	√	√	√	√	√	√	√				√
Red	-53	√	√	√	√	√	√	√	√	√	√	√				√
Oxford Gray	-52										√	√	√		√	
Orange	-29	√	√	√	√	√	√	√	√	√	√	√				√
Yellow	-56	√	√	√	√	√	√	√	√	√	√	√				√
White	-58	√	√	√	√	√	√	√	√	√	√	√				√
Rose Pink	-59	√	√	√	√	√	√	√	√	√	√	√				√
Light Beige	-60	√	√	√	√	√	√	√	√	√	√	√				√
Light Gray	-61	√	√	√	√	√	√	√	√	√	√	√				√
Aqua Blue	-62	√	√	√	√	√	√	√	√	√	√	√				√
Turquoise	-64	√	√	√	√	√	√	√	√	√	√	√				√
Chameleon Gray	-35	√														

* The QDB1N dial is available only with a white faceplate with black numerals.

Note: Bell Canada standard dials are: QDB1A-03, QDB1B-03, QDB1P-52, QDB1M-52, QDB1N.

TABLE C
REPLACEMENT PARTS QDB1-TYPE DIALS

DIAL	DIAL MECHANISM	FINGERWHEEL	FINGERSTOP	NUMBER PLATE
QDB1A	P0894297	P097M849	P097M988	P097A700* P096E300†
QDB1B	P0894298	P097M849		P097A700* P096E300†
QDB1C	P0894297	P097M849		P0897000
QDB1D	P0894298	P097M849		P0897000
QDB1E	P0896367	P0896361		P0899000
QDB1G	P0894297	P097M849		P0899900
QDB1H	P0896367	P0896361		P0896600
QDB1J	P0897522	P097M849		P0899900
QDB1K	P0897522	P097M849		P0897000
QDB1K1	P0892815	P097M849		P0897000
QDB1L	P0894297	P0892576		P0892600
QDB1M	P0514063	P0892576		P0502200‡
QDB1N	P0894298	P0892576		P0515909
QDB1P	P0514063	P0892576		P0892600
QDB1R	P0525816	P097M849		P0897000

* With "Operator"
† Without "Operator"
‡ Part name is Alpha Plate

3. MAINTENANCE

3.01 The following list of inspections and requirements are given for the maintenance of QDB1-type dials. The replaceable components are shown in Fig. 2 and listed in Table C.

- Parts of the dial must not be broken or missing
- The fingerwheel must be tight and undamaged.
- The fingerstop must not be loose or damaged.
- The dial must operate smoothly, without slipping or skipping. Check by operating the dial several times. Replace the dial mechanism, if it fails to meet this requirement.
- Replace the dial mechanism, if you suspect it of giving wrong numbers, or of improper dial speed or gear mesh.
- ***Do not lubricate any part of the dial.***
- Do not attempt to adjust the pulsing rate or percent break.
- Do not lift or carry the dial by the dial leads.

3.02 Defective components can be replaced as described below.

A. Fingerwheel

Removal

(1) Rotate the fingerwheel as far as possible in a clockwise direction.

(2) Insert an NS-16750L3 releaser in the small hole located at the edge of the number card between the 9 and 0 finger holes (Fig. 4). Push down on the releaser to disengage the clamp spring.

(3) Rotate the fingerwheel further clockwise until it can be lifted off.

Assembly

(1) Place the fingerwheel on the clamp plate with the 0 finger hole over the dot above the digit 9.

(2) Rotate the fingerwheel counterclockwise until the clamp spring snaps into the notch on the underside of the fingerwheel.

B. Fingerstop

Removal

(1) Depress the plastic locking tab (Fig. 5) with an NS-16750L3 releaser.

(2) With the locking tab depressed, pull the fingerstop out until it is fully disengaged.

Assembly

Insert the fingerstop in the hole in the numberplate, and push in until it locks in position.

C. Number Plate

Removal

(1) Remove fingerstop and fingerwheel.

(2) Rotate the number plate counterclockwise until it is released.

(3) Raise the top of the number plate until it clears the clamp plate.

(4) Lift the number plate off the dial mechanism.

Assembly

(1) Place the number plate over the dial mechanism (using the clamp spring tab as an indicator pointing between digits 8 and 9). Insert the lower side of the number plate over the clamp spring first and then the top. Twist the number plate clockwise as far as possible.

(2) Replace the fingerstop and fingerwheel.

Fig. 4 — Removal of Fingerwheel

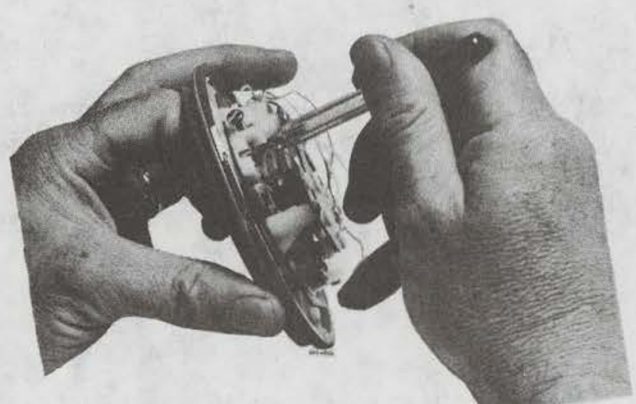

Fig. 5 — Removal of Fingerstop

STATION DIALS

25-TYPE

IDENTIFICATION AND MAINTENANCE

1. GENERAL

1.01 This section is reissued to revise the illustrations and to make associated changes in the text.

1.02 Due to extensive changes, marginal arrows have been omitted.

2. IDENTIFICATION

2.01 The 25-type TOUCH-TONE dial is a 10-button multifrequency dialing device. It is equipped with pushbuttons having numbers and letters (Fig. 1). It has a transistorized oscillator, printed circuit board, frequency contacts, and a common switch.

2.02 The transistorized oscillator generates the customer dialing signals and is powered by current from the telephone line.

Fig. 1 — 25-Type Dial, Front View

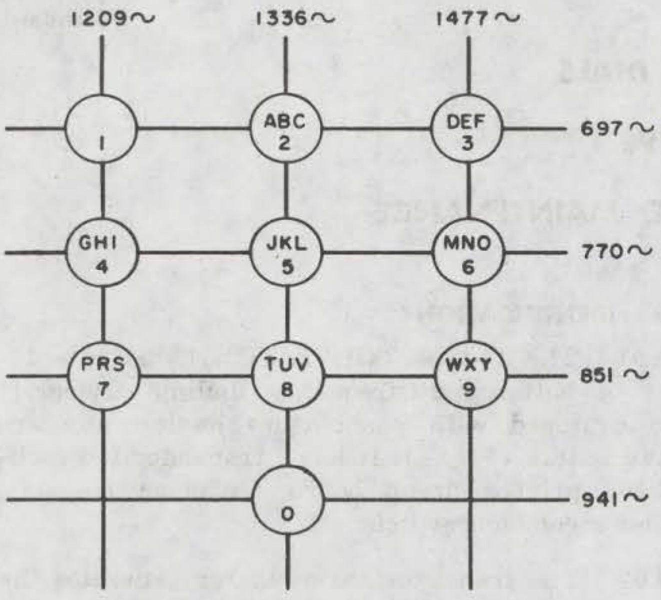

Fig. 2 — Dial Frequencies

2.03 Any pushbutton depressed will close one low band and one high band frequency contact. These contacts close a path for 2 of the 7 output frequencies of the oscillator. (Fig. 2).

2.04 Continued travel of the button will operate the common switch (Fig. 3). Each button operates a different pair of frequency contacts. All buttons operate the common switch. The signal will remain on the line as long as the button is depressed. For example: when button number 5 is depressed, it selects frequencies of 770 and 1336 cycles simultaneously for transmission to the central office.

2.05 The common switch (Fig. 3), when operated, reduces the sidetone to the receiver, opens the transmitter path, applies bias voltage to the transistorized oscillator, and breaks the dc energy path to the tank coils.

2.06 The central office must be equipped with a converter that will accept the oscillator signals and translate them into a 2-out-of-5 digit code for cross-bar offices or dial pulses for step-by-step offices. The converter in the central office does not interfere with rotary dial pulse signals. Both TOUCH-TONE and rotary dial type sets may be served by the same central office equipment.

TABLE A

DIALS

DIAL NUMBER	PUSHBUTTON CHARACTERS	USES	REMARKS	FIG. NO.
25A3	Letters and Numbers	General purpose; in desk, wall, and panel mounted telephone sets	Has standard common switch. Cannot be used with 3A speakerphone.	1, 3 & 6
25B3		In telephone sets for 3A speakerphone systems	Similar to 25A3 dial but has an expanded common switch and additional leads.	4
25E3		In coin telephone	Similar to 25A3 dial but has modified circuit for use with coin telephones.	8
25H4		For use in PRINCESS sets	Dial light illuminates the pushbuttons by means of a clear plastic light guide mounted within the dial.	5 & 6

Dials are available in grey only.

3. MAINTENANCE

Maintenance of 25-type dial consists only of determining if the dial is defective. Do not attempt adjustments of the dial in the field.

Note: Check polarity of dial before testing to determine if dial is defective.

3.01 The 25-type dial will function only when the O-BK dial lead is connected to the ring (− negative) side of the line and the G dial lead is connected to the tip (+ positive) side of the line.

3.02 Use the following methods to determine if the dial is defective:

(1) Check for presence of dial tone. If no dial tone is heard, make a check with the 1011 test set at the connecting block. If dial tone is heard at the conecting block, make normal test of telephone set components as described in appropriate sections.

(2) Break dial tone by dialing digit 2. If unable to break dial tone, restore switch hook to normal and connect 1011 test set across incoming line terminations of network. Dial a digit to break dial tone. If dial tone can be broken at the network, replace the dial.

(3) Check all buttons for tone feedback. When any button is depressed, two tones should be heard. These tones are blended together but can be identified as two tones. When any two adjacent buttons are depressed simultaneously, only one tone should be heard.

(4) Replace dial if feedback tones are not as described.

(5) Dial the station ringer test circuit for test of TOUCH-TONE dials. Refer to Section 951-920-100 for details.

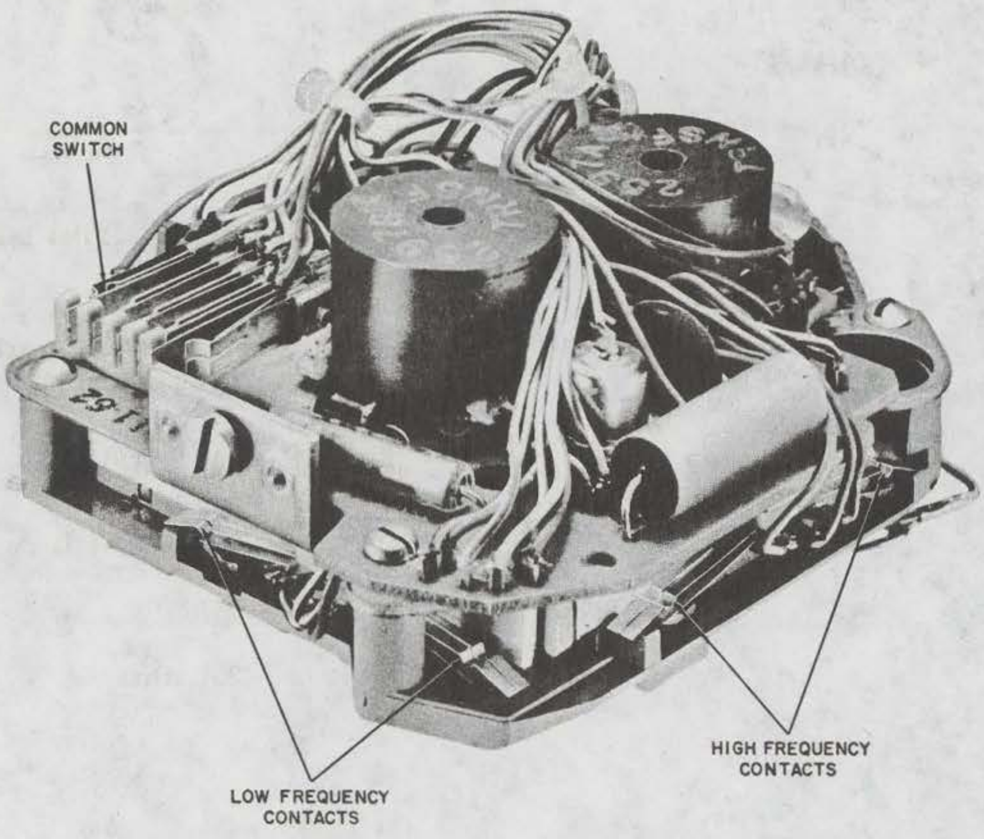

Fig. 3 — 25-Type Dial, Rear View

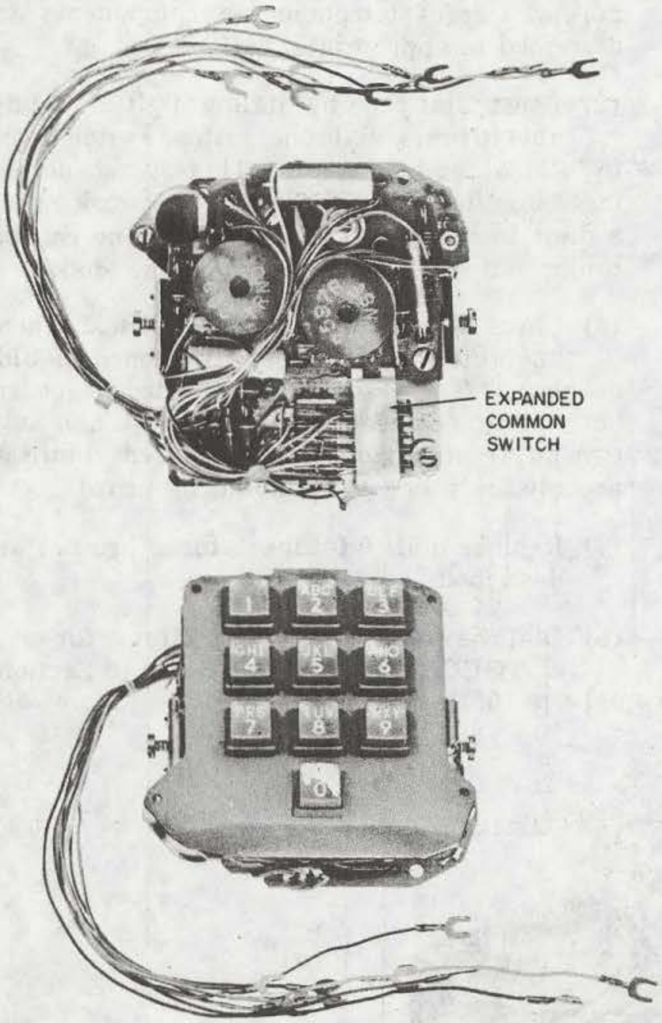

Fig. 4 — 25B3 Dial

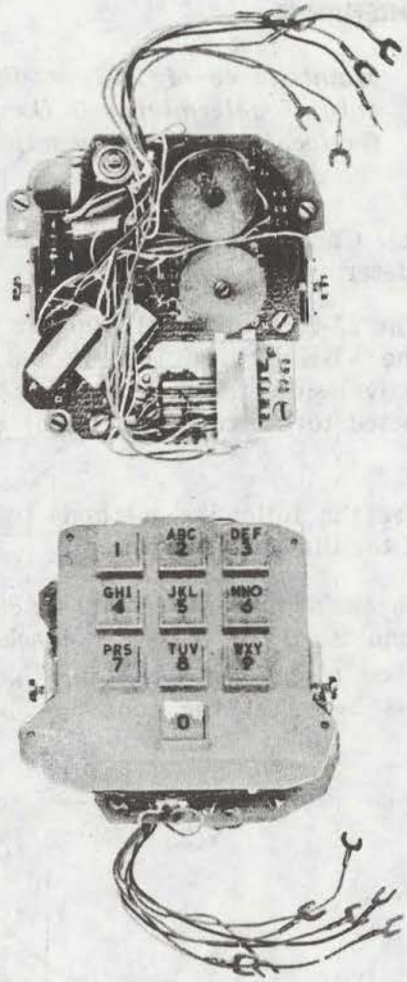

Fig. 5 — 25H4 Dial

3.03 If telephone set meets requirements in Part 3 and trouble still exists, check the central office or PBX equipment.

4. SCHEMATIC INDEX

Fig. 6 — 25A and H Dials

Fig. 7 — 25B Dial

Fig. 8 — 25E Dial

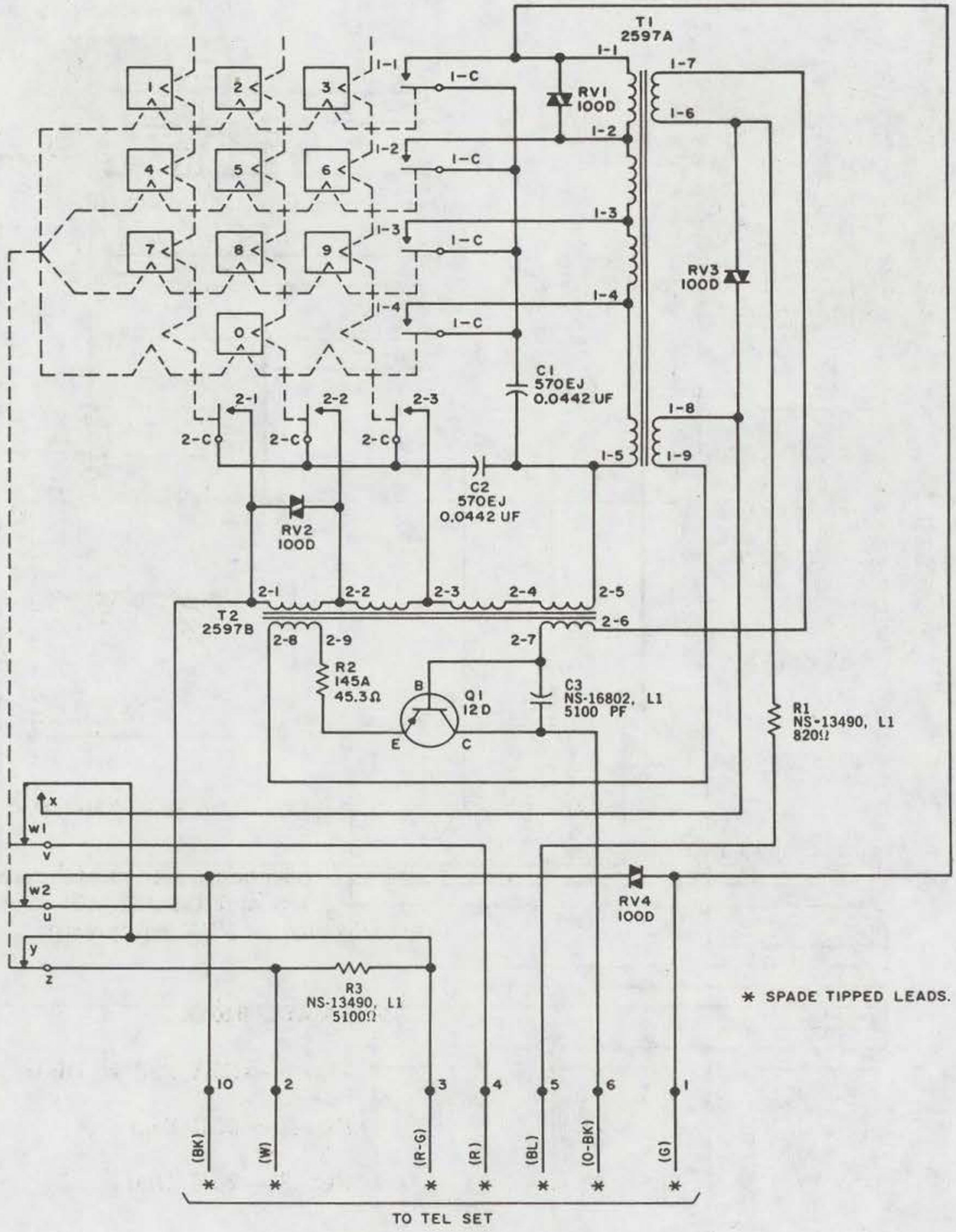

Fig. 6 — 25A and H Dials

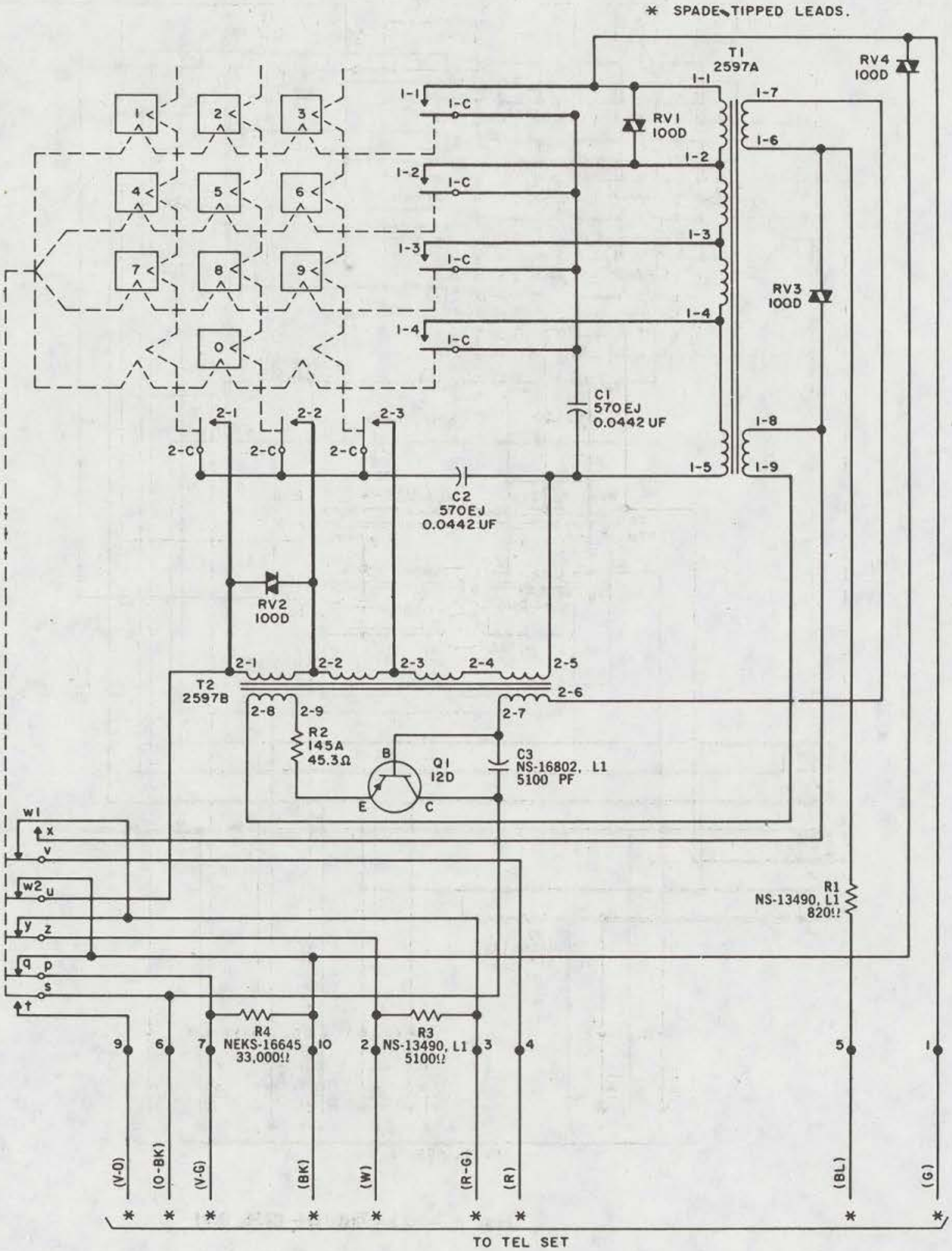

Fig. 7 — 25B Dial

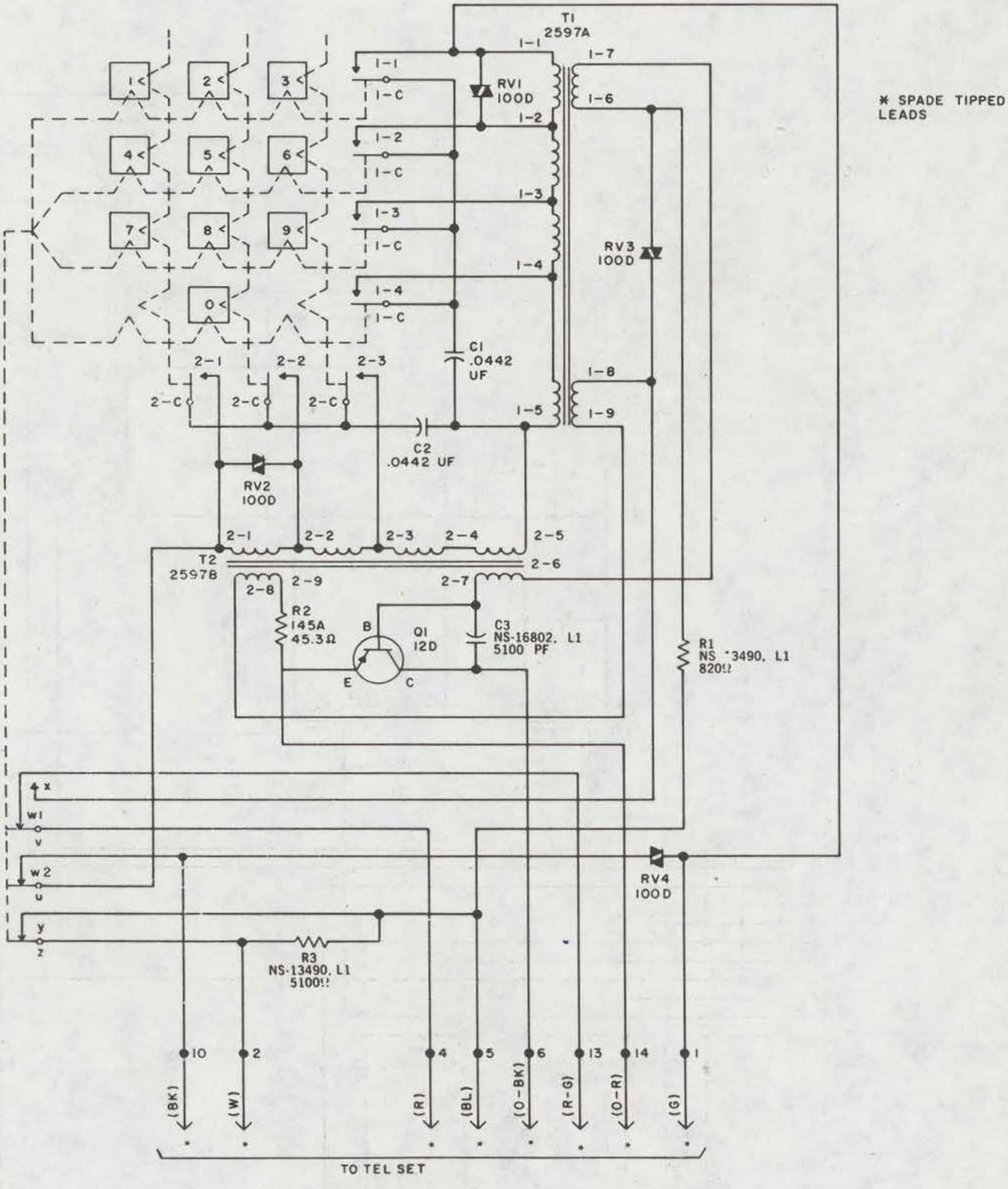

Fig. 8 — 25E Dial

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SECTION 501-164-115CA
Issue C, July, 1970
Bell Canada
Standard

STATION DIALS

35-TYPE

IDENTIFICATION AND MAINTENANCE

1. GENERAL

1.01 This section provides information on 35 type dials.

1.02 This section is reissued to add information on the 35Q3J Dial.

1.03 The 35-type dials (Fig. 1 and 2) are TOUCH-TONE® dials having twelve pushbuttons. Ten are used in "number-letter" calling and two are used to give special service connections.

1.04 The twelve pushbuttons, switches, and multifrequency oscillator are a unit. It is mounted in a manner similar to a rotary dial.

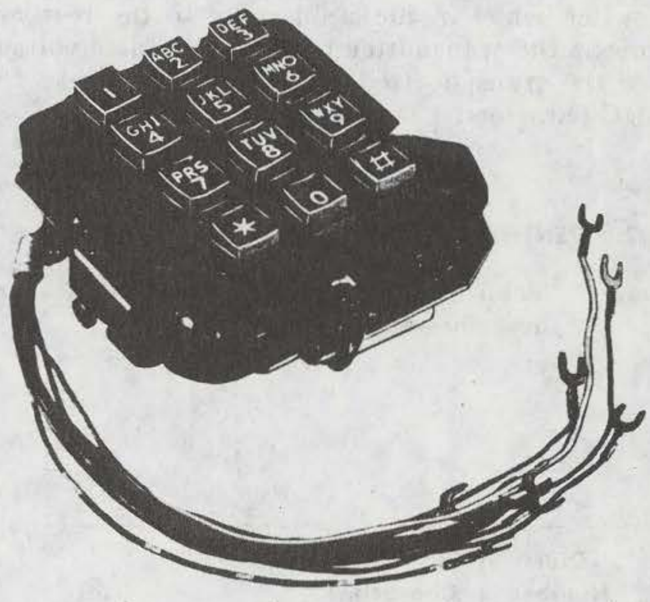

Fig. 1 — 35-Type Dial — Front View

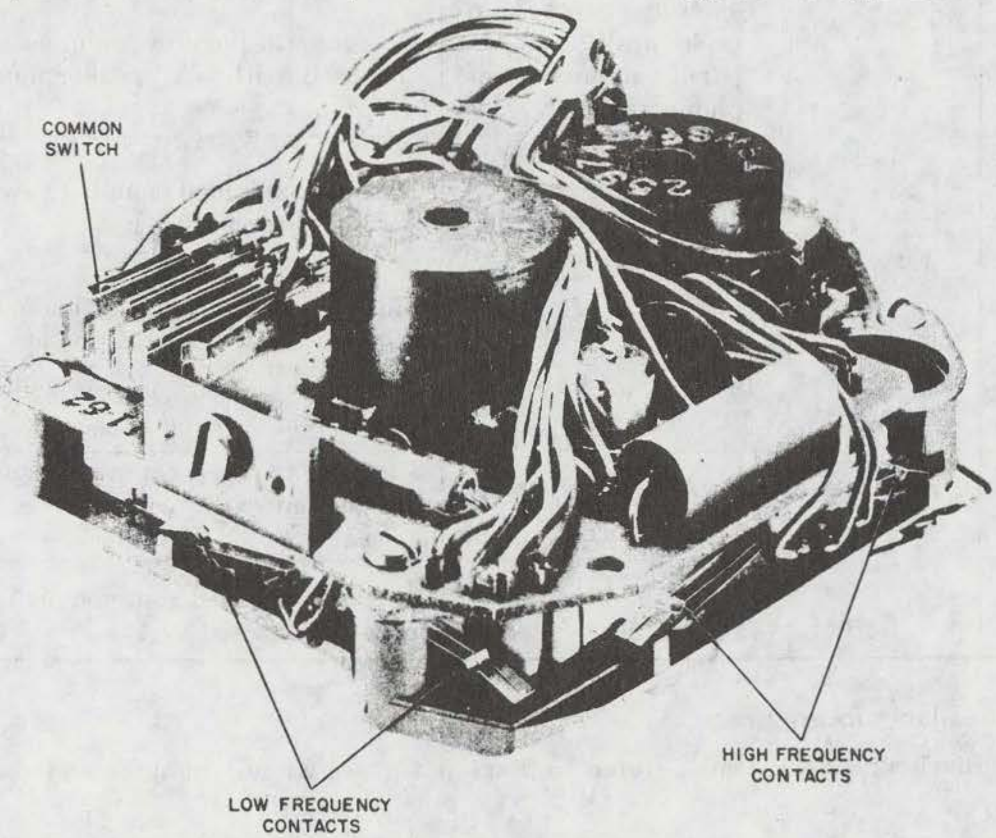

Fig. 2 — 35-Type Dial — Rear View

|1.05 The transistorized oscillator generates the customer dialing signals and is powered by current from the telephone line.

|1.06 Each pushbutton operates a different pair of frequency contacts which closes a path for 2 of the 7 output frequencies of the dial (Fig. 3). All pushbuttons operate the common switch which reduces side tone to the receiver, opens the transmitter path, applies bias voltage to the transistorized oscillator, and breaks the DC path to the tank coils.

2. IDENTIFICATION

2.01 Table A lists the 35-type dials and describes their uses.

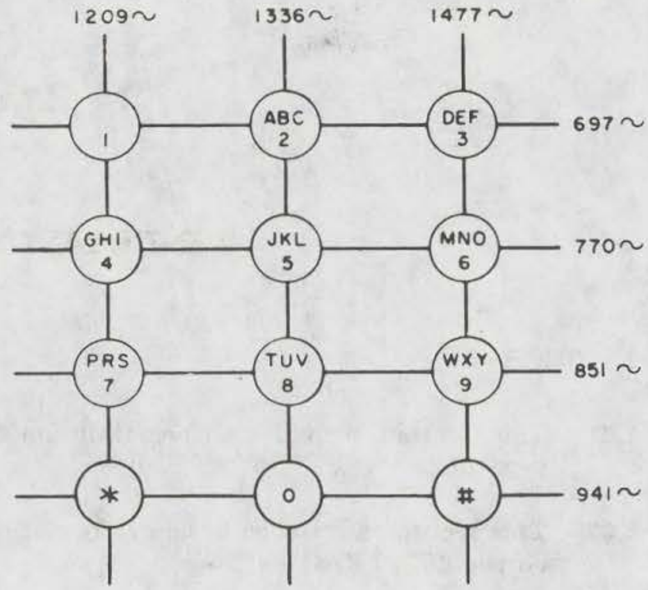

Fig. 3 — Dial Frequencies

TABLE A

DIALS

Dial Number	Pushbutton Characters	Uses	Remarks	Fig. No.
35A3 35Q3A*	See Fig. 1	General purpose; in desk, wall, and panel mounted telephone sets	Has general purpose common switch. Cannot be used with 3A speakerphone.	4 4A
35B3 35Q3B*		In telephone sets for 3A speakerphone systems and in the 1035B3QA dial	Has an expanded common switch and wiring consistent with use.	5 5A
35E3 35Q3E*		In coin telephones	Similar to 35A3 dial but has modified circuit for use with coin telephones.	6 6A
35J3 35Q3D*		In 1- and 2-type consoles	Has an expanded common switch and wiring consistent with use.	7 7A
35B3QA 35Q3C*		Business Interphone	Has an expanded common switch and wiring consistent with use.	8 8A
35Q3J		Multicom Medium Speed Service	Has an expanded common switch and wiring consistent with use.	9

Dials are available in grey only.

*Have no Black or Green leads. Refer to Part 5 for set wiring changes and connection information.

3. MAINTENANCE

Maintenance for the 35-type dial consists only of determining if the dial is defective. Do not attempt adjustments of the dial in the field.

3.01 To maintain proper dial polarity, refer to sections containing connections for the telephone sets of which this dial is a component.

3.02 The 35-type dial must be poled properly. It will function only when the (O-BK) dial lead is connected to the ring (– negative) side of the circuit and the (OR) dial lead is connected to the tip (+ positive) side of the circuit.

3.03 If unable to dial, proceed as follows:

(1) Check wiring for secure and correct connections. See Part 5 for changes to set wiring when using new type dials.

(2) Check for presence of dial tone. If no dial tone is heard, check with 1011-type test set at connecting block. Make normal tests of telephone components as described in appropriate sections.

(3) Check all buttons for tone feedback. Two tones should be heard in the receiver when any button is depressed. These tones are blended together, but can be separately identified. When any two adjacent buttons are depressed simultaneously, only one tone should be heard. If feedback tones are not as described, replace dial.

3.04 To test dial frequency and amplitude outputs, dial the station ringer test circuit provided for TOUCH-TONE dials. Refer to Section 951-920-100 for details.

3.05 If dial meets requirements of 3.03 and 3.04 and trouble still exists, check Central Office or PBX equipment.

4. SCHEMATICS

Fig. 4 — 35A3-Type Dial
Fig. 4A — 35Q3A-Type Dial
Fig. 5 — 35B3-Type Dial
Fig. 5A — 35Q3B-Type Dial
Fig. 6 — 35E3-Type Dial
Fig. 6A — 35Q3E-Type Dial
Fig. 7 — 35J3-Type Dial
Fig. 7A — 35Q3D-Type Dial
Fig. 8 — 35B3QA-Type Dial
Fig. 8A — 35Q3C-Type Dial
Fig. 9 — 35Q3J-Type Dial

5. CONNECTION INFORMATION 35Q TYPE DIALS

5.01 To replace existing 25 and 35 Type dials with the new 35Q Type dial proceed as follows:

Note: 35Q Type Dials have no black or green leads.

(a) *1500DQ1A, 1554BQ1A, 2500DQ1A and 2554BQ1A Telephone Sets*

Connect the O-BK, R, W, and R-G leads to the same locations as the existing dial. Move the S-W switchhook lead from F to RR on the network.

(b) *1511 and 2511 Telephone Sets*

Connect the O-BK, V-W, V-G, R, R-G and W leads to the same locations as the existing dial. Move the S-G 631A key lead from L1 to RR on the network.

(c) *1558DR & 2558DR Telephone Sets*

Connect the R-G, W, R, and O-BK leads to the same locations as the existing dial. Move the S-G pick-up key lead from F to RR on the network.

(d) *1565 and 2565 Type Telephone Sets* (other than those listed below)

Connect the O-BK, V-W, V-G, R, R-G and W leads to the same locations as the existing dial. The G lead of the 636A Key should be moved from L2 to RR on the network.

(e) *1565Q1B and 2565Q1B Telephone Sets*

Connect the BL-BK, V-G, V-W, R, W, R-GN, O-BK, and S leads to the same locations as the existing dial. The S-W switchhook lead should be moved from F to RR on the network.

(f) *2565LQF and LQE Telephone Sets*

Connect the V-G, O-BK, R-G, R, W, and V-W leads to the same locations as the existing dial. Move the G pick-up key lead from F to RR on the network.

(g) *1630 and 1631 Type, 2630 and 2631 Type Telephone Sets*

Connect the W, R-G, R, V-G, V-W and O-BK leads to the same locations as the existing dial. Move the V-BL mounting cord lead from terminal 4 on the terminal strip to RR on the network.

(h) *1634 and 1635 Type, 2634 and 2635 Type Telephone Sets*

Connect the W, R-G, R, V-G, V-W and O-BK leads to the same location as the existing dial. Move the W-BL mounting cord lead from terminal 4 on the terminal strip to RR on the network.

(i) *1 & 2, QCN 3 & 4 Type Consoles*

Connect the W, R-G, R, BL-BK, O, G-W, V-BL and O-BK leads to the same location as the existing dial. Connect a jumper between terminals 1 and 7 of the dial assembly terminal strip.

(j) *1236 and 2236 QAS Coin Telephones*

Connect the BL, W, R, R-G, O-BK and O-R leads to the same location as the existing dial. Connect a jumper between C on the network and 6 on the terminal strip.

(k) *2565QHA Telephone Set*

Connect dial leads as follows:

R-G	R of network
R	Y of network
V-G	G of network
W	RR of 636QM Key
V-W	SG of 636QM Key
BK	6 of 636QM Key
G	ON1 of 636QM Key
O-BK	C of network

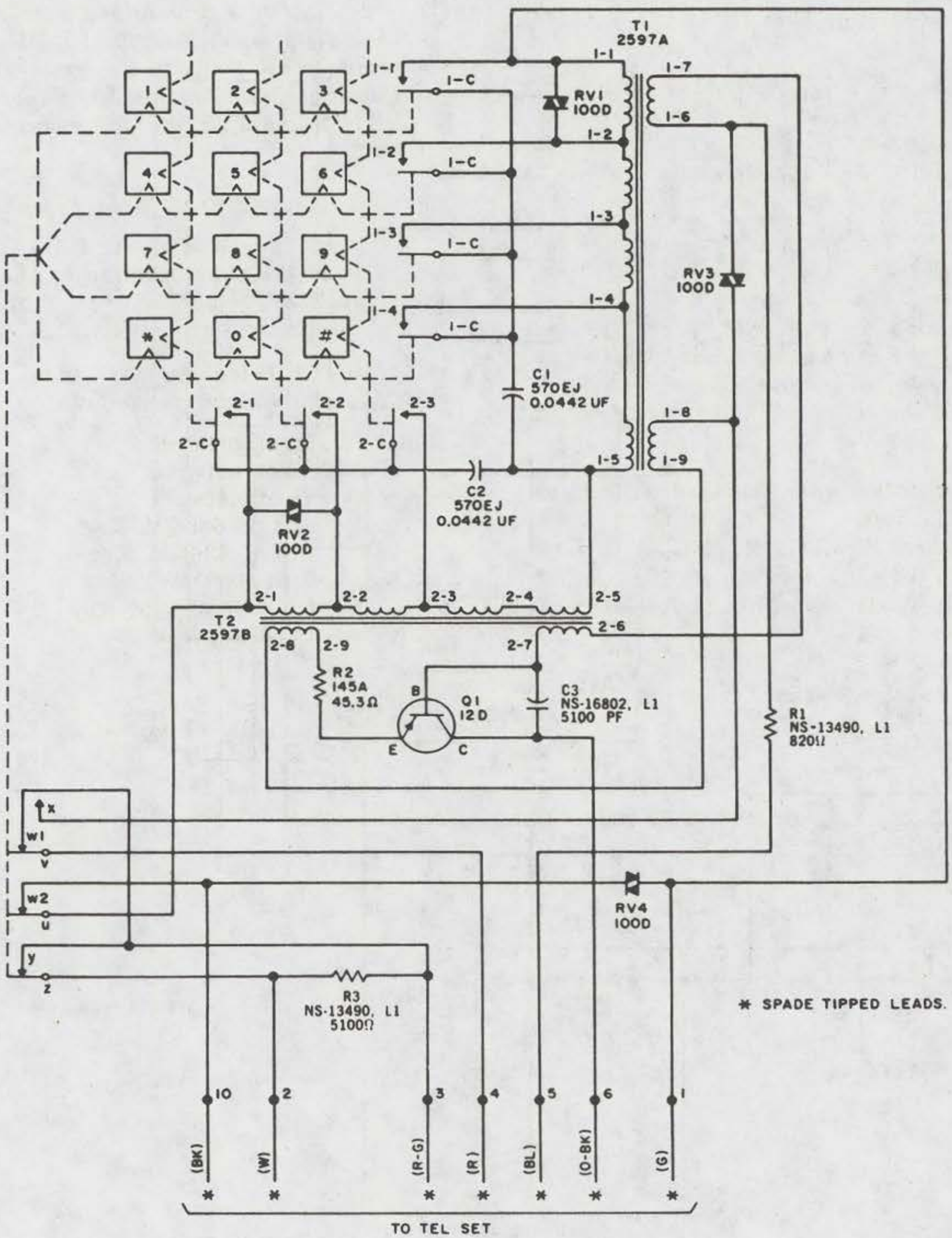

Fig. 4 — 35A3 Dial

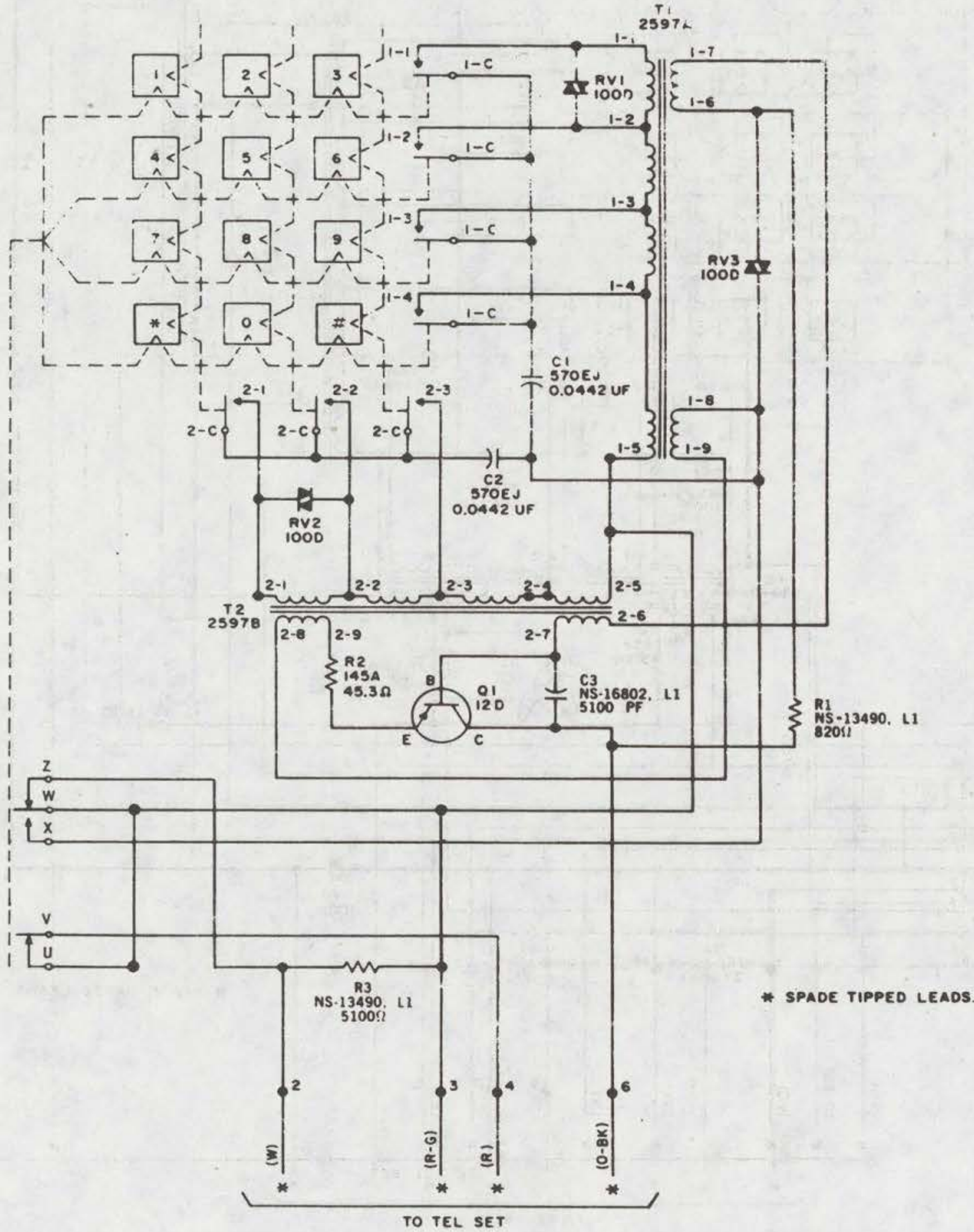

Fig. 4A — 35Q3A Dial

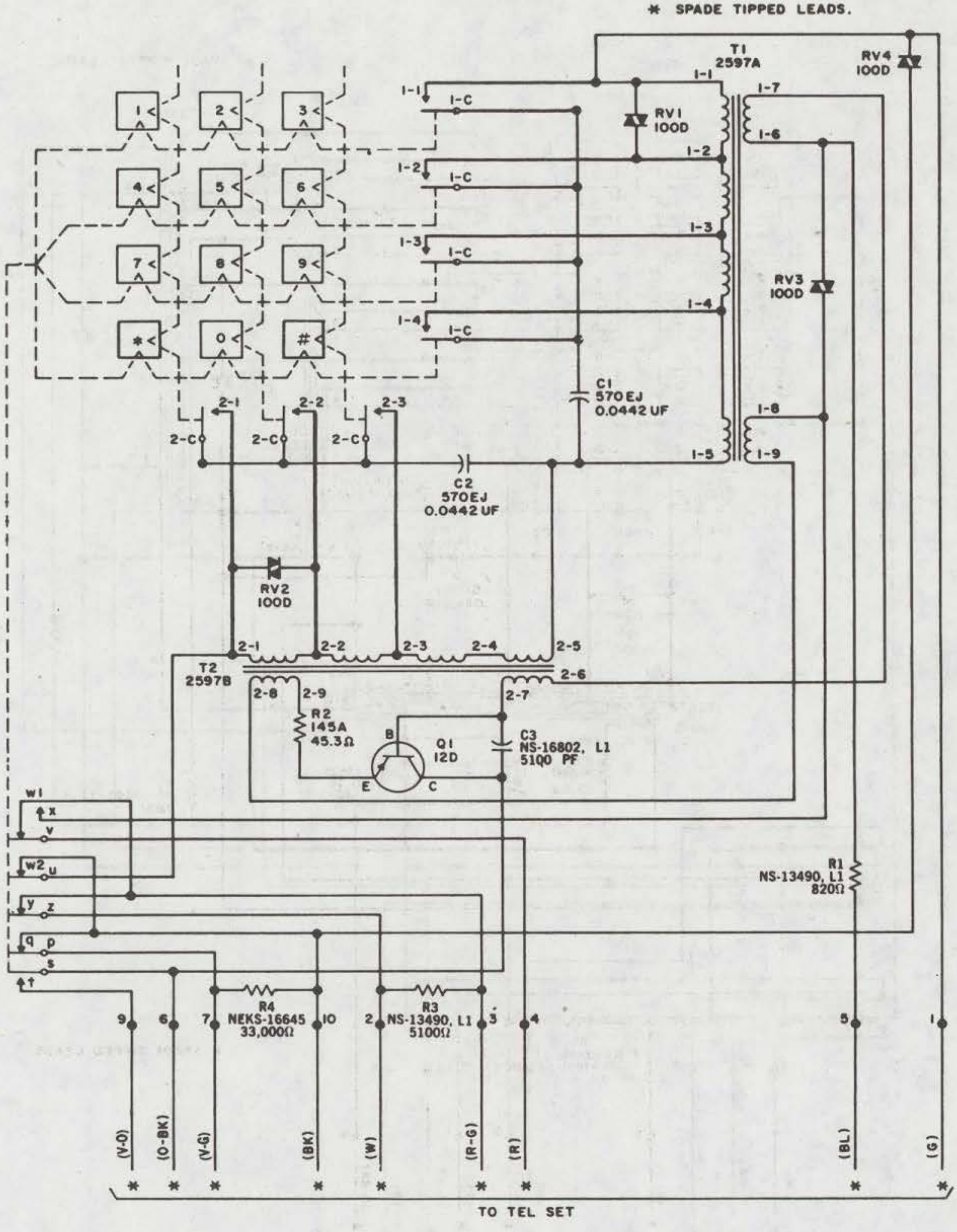

Fig. 5 — 35B3 Dial

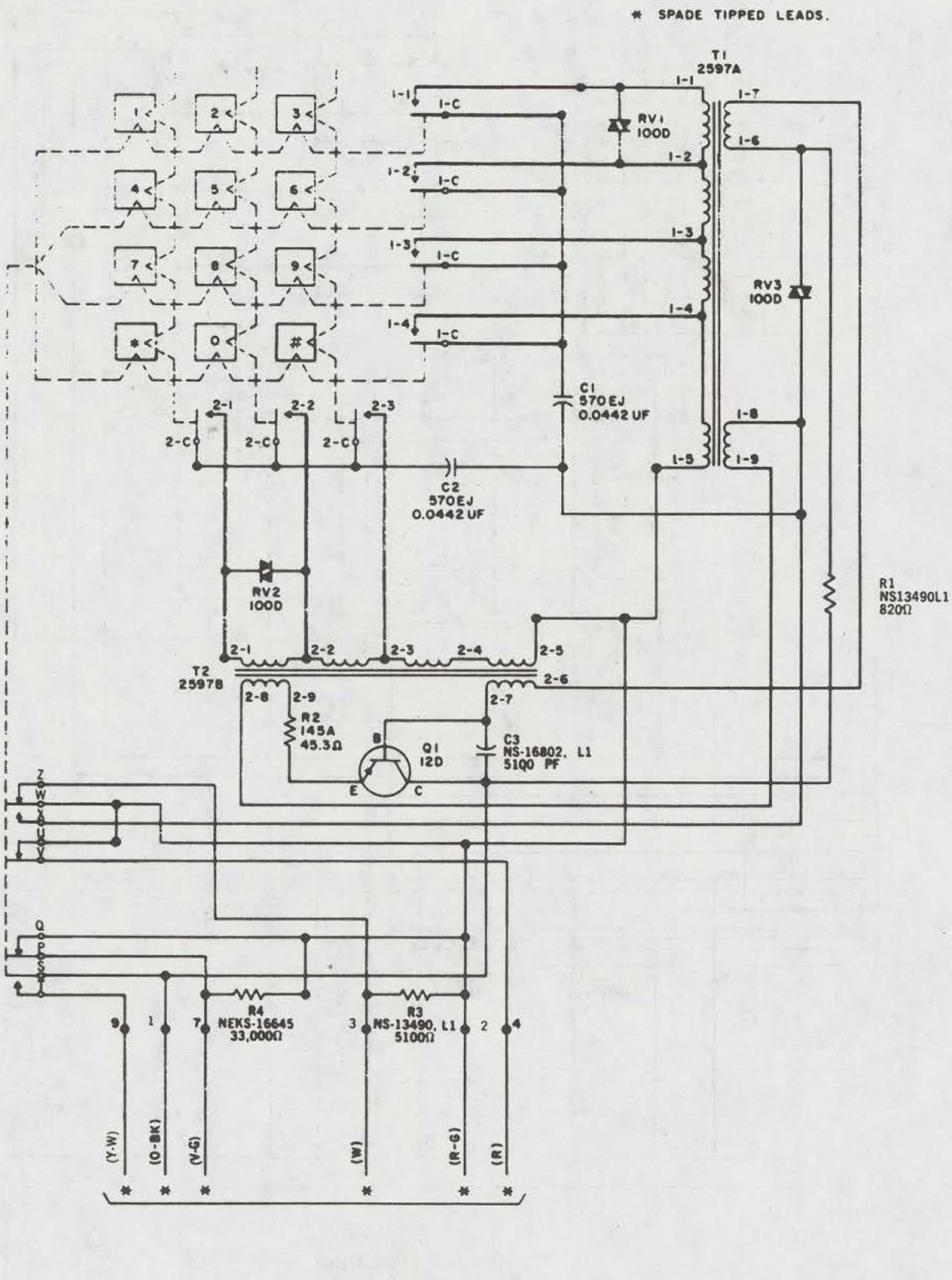

Fig. 5A — 35Q3B Dial

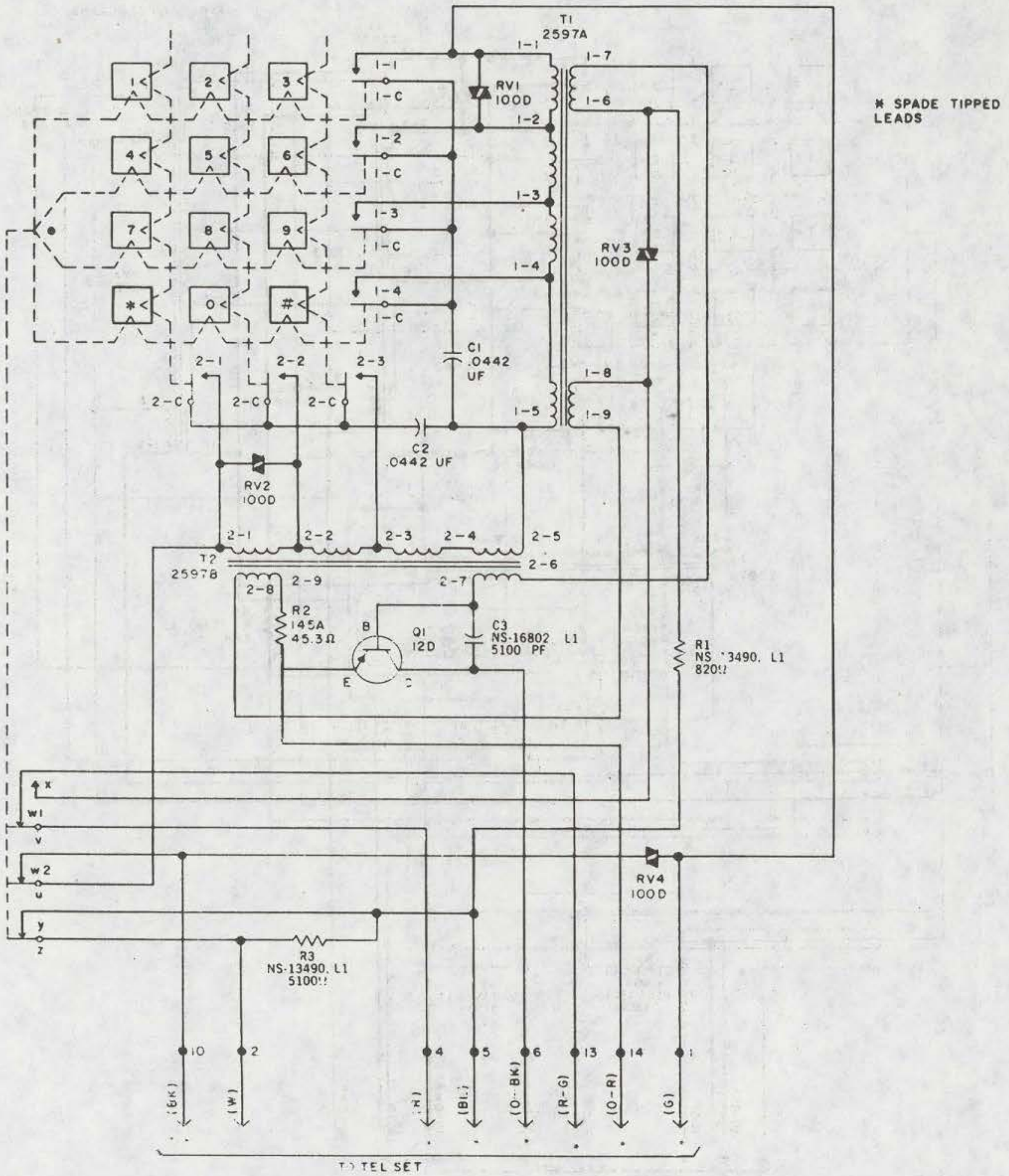

Fig. 6 — 35E3 Dial

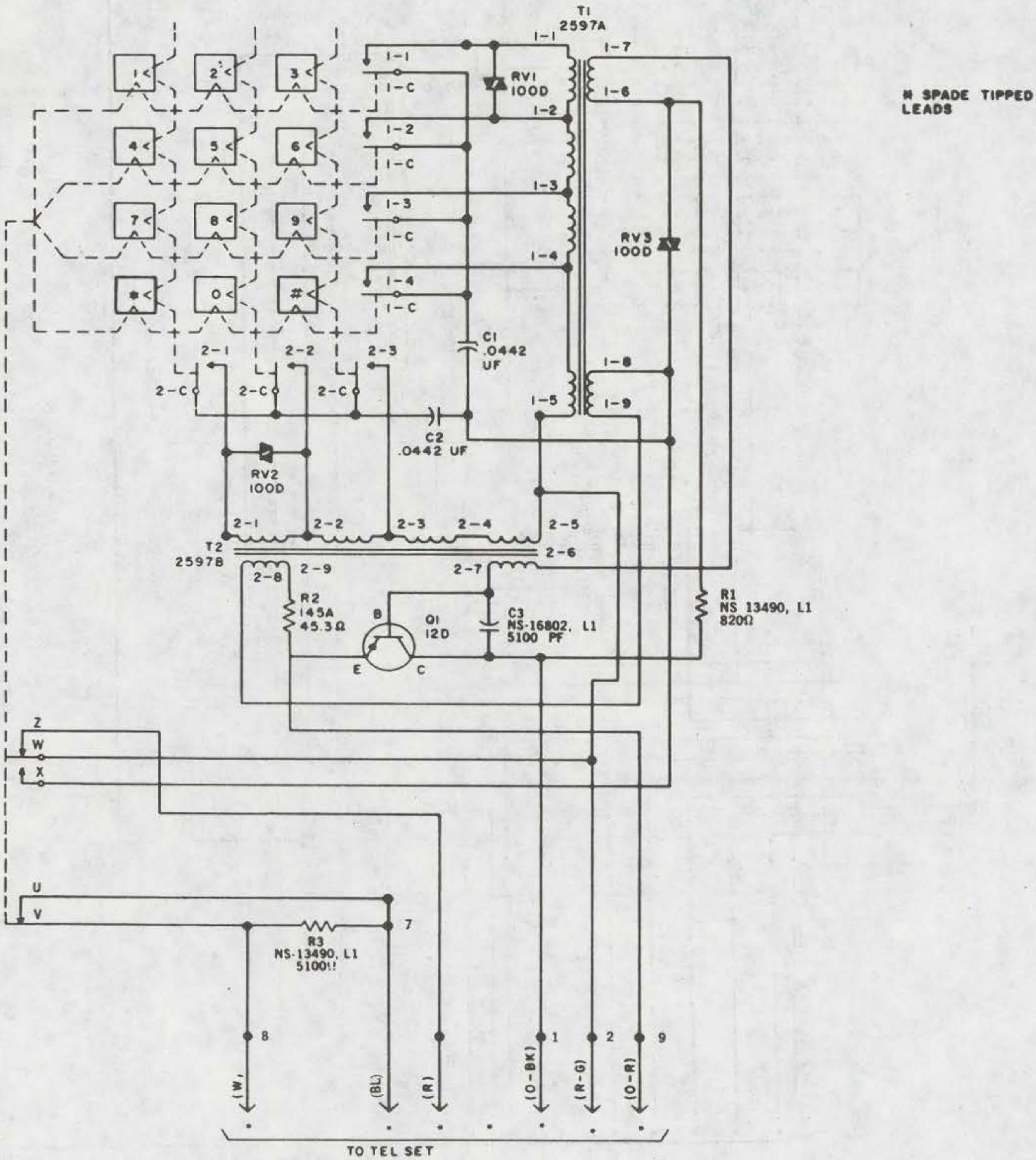

Fig. 6A — 35Q3E Dial

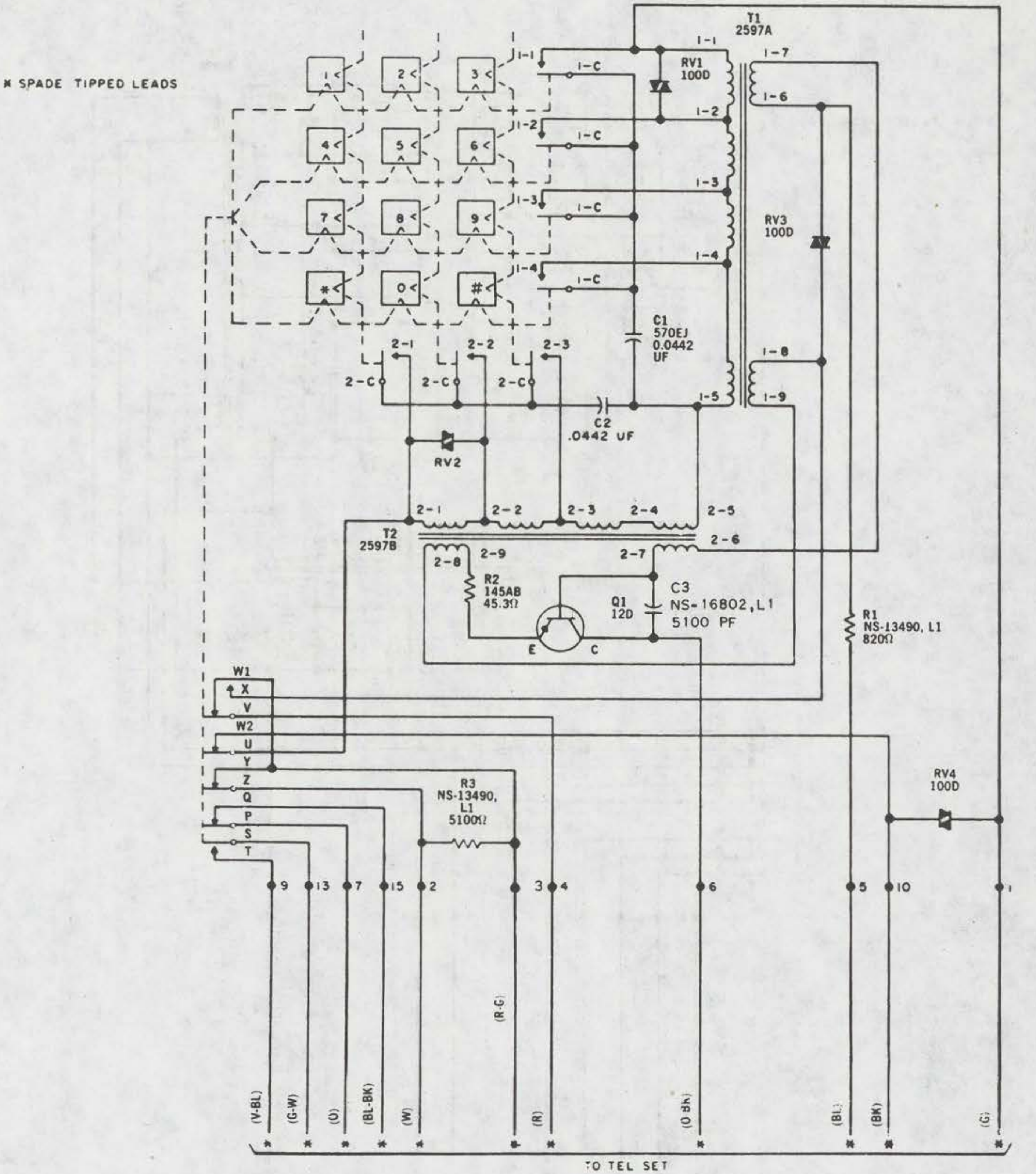

Fig. 7 — 35J3 Dial

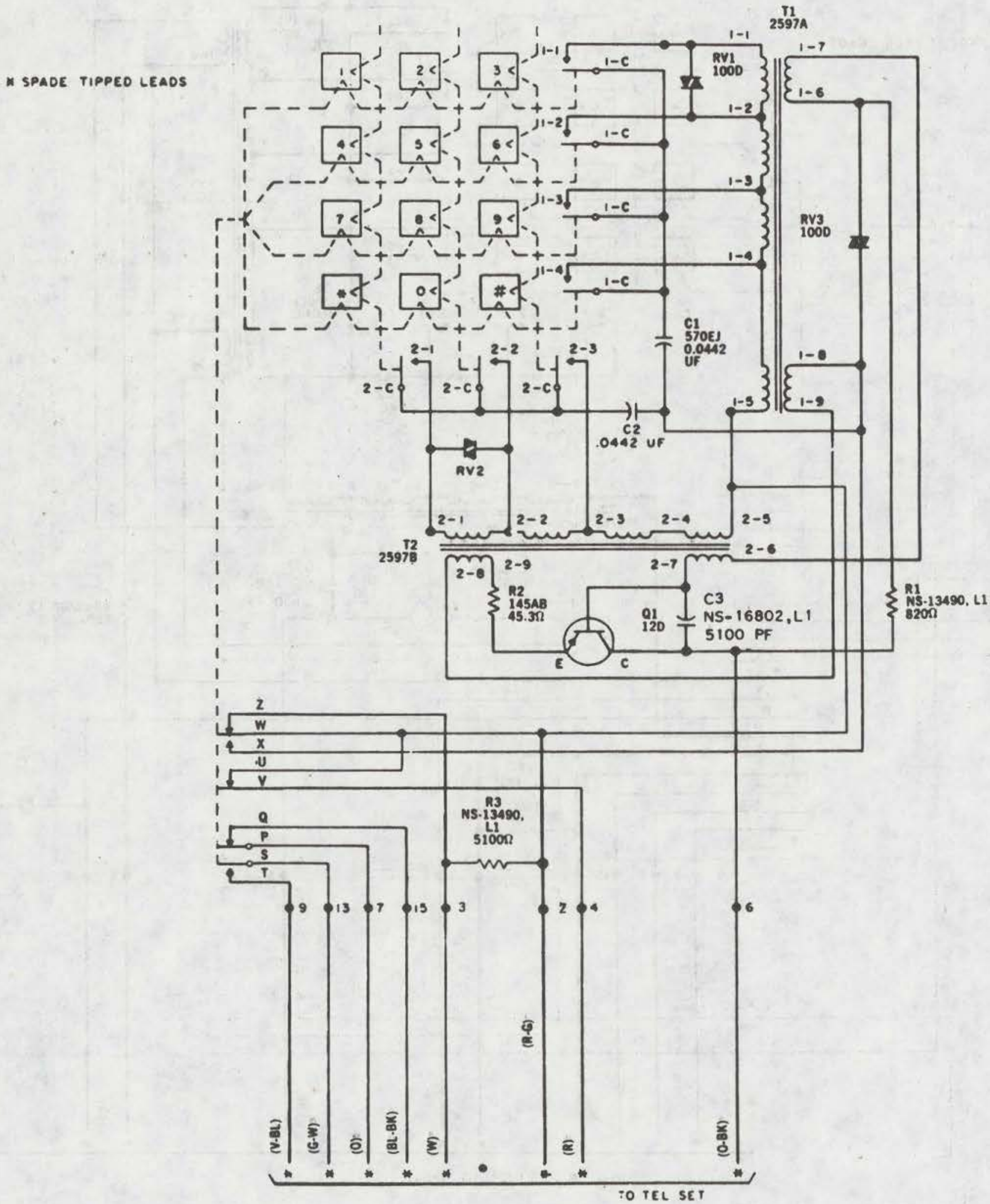

Fig. 7A — 35Q3D Dial

* SPARE TIPPED LEADS

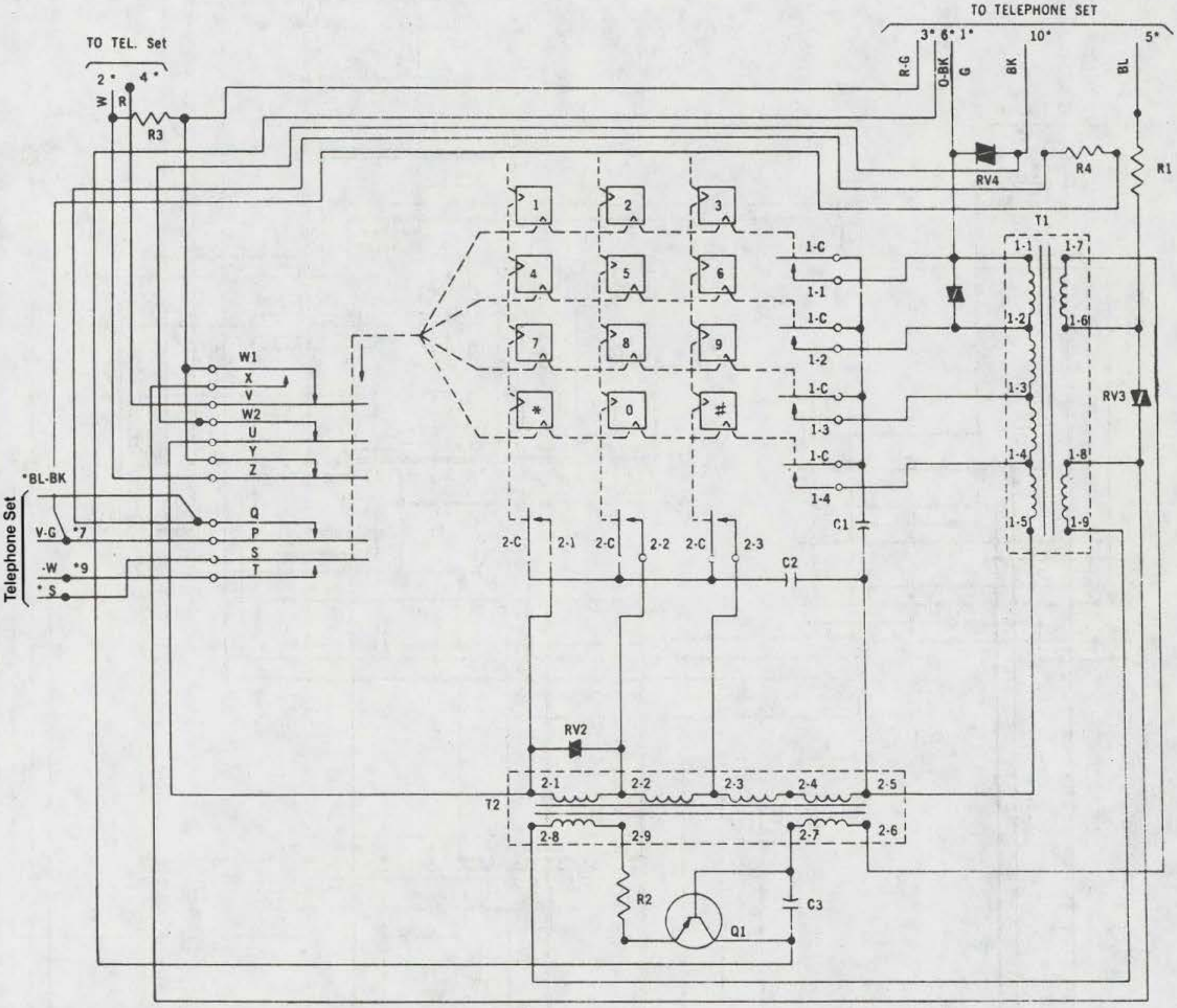

Fig. 8 — 35B3QA Dial

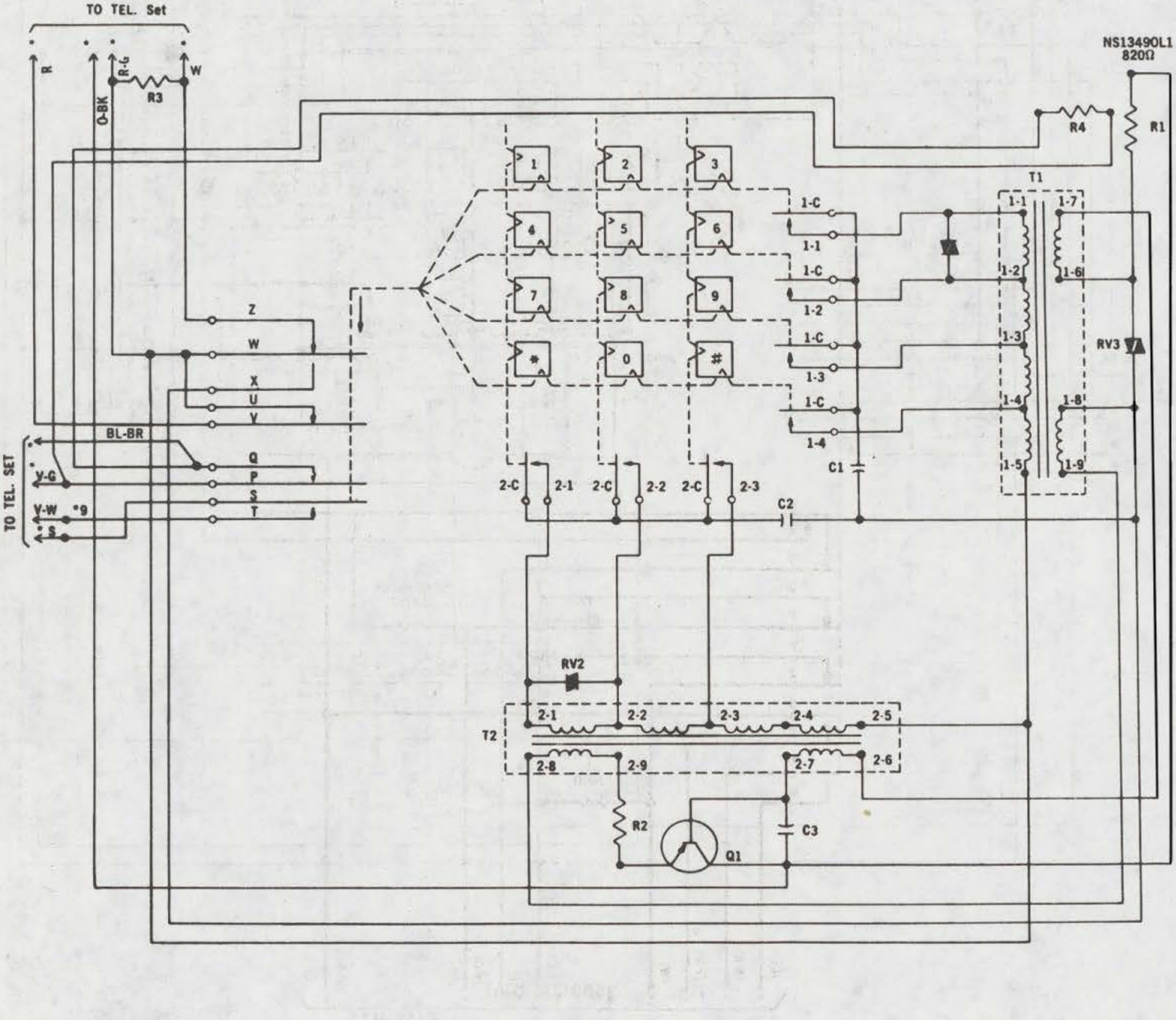

Fig. 8A — 35Q3C Dial

*Spade Tipped Leads

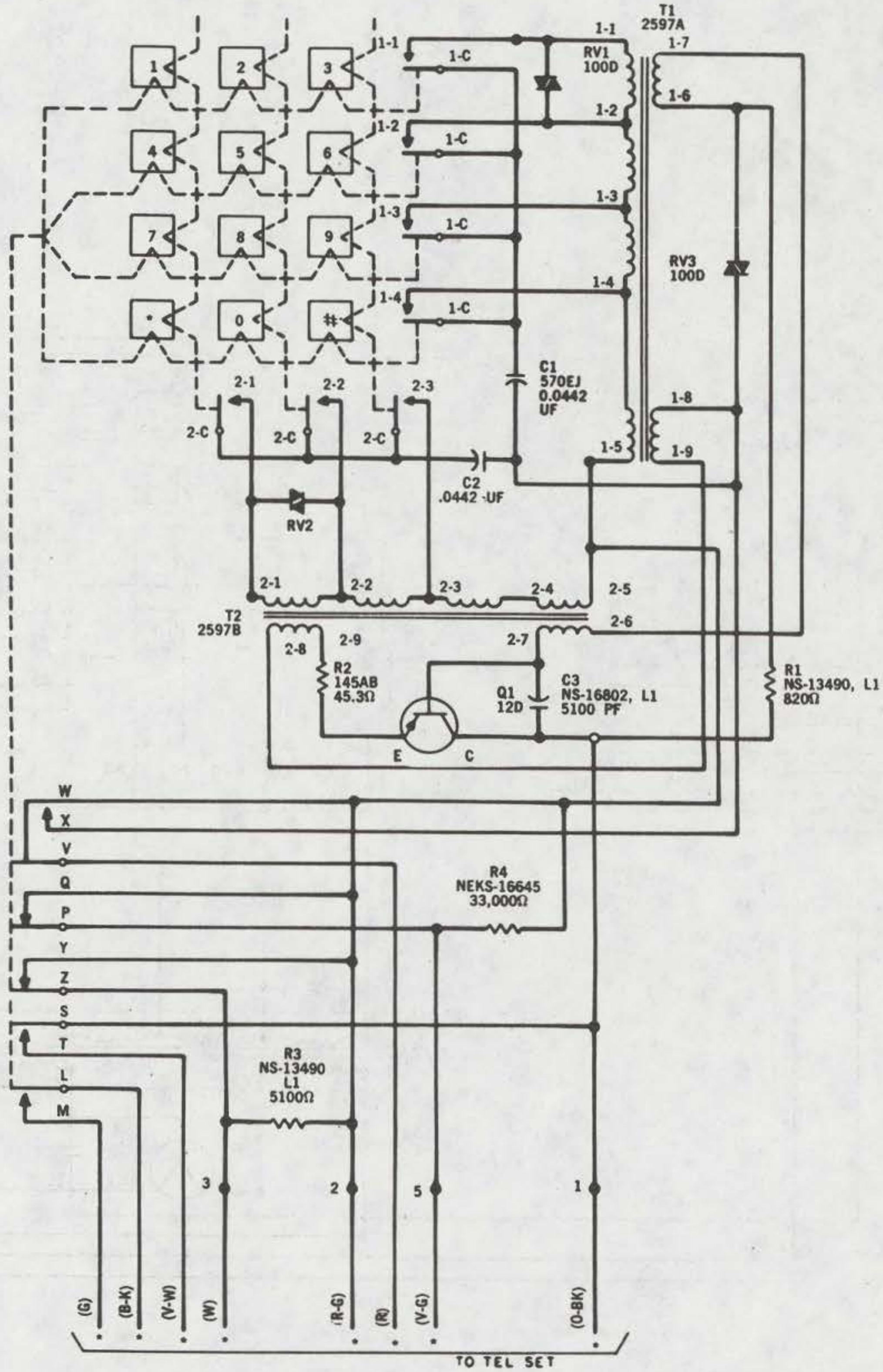

Fig. 9 — 35Q3J Dial

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STATION DIALS

NE-35Q TYPE

1. GENERAL

1.01 This section contains identification, maintenance, and connection information for NE-35Q type DIGITONE* dials that are used in telephone sets and telephone consoles.

1.02 This section is reissued to add Part 5 Connection Information NE-35Q Dials, and to revise Table A.

2. IDENTIFICATION

2.01 The NE-35Q type DIGITONE dial is a 12-button multifrequency dialing device. It is equipped with pushbuttons having both numbers and letters, a transistorized oscillator and a common switch (Fig. 1).

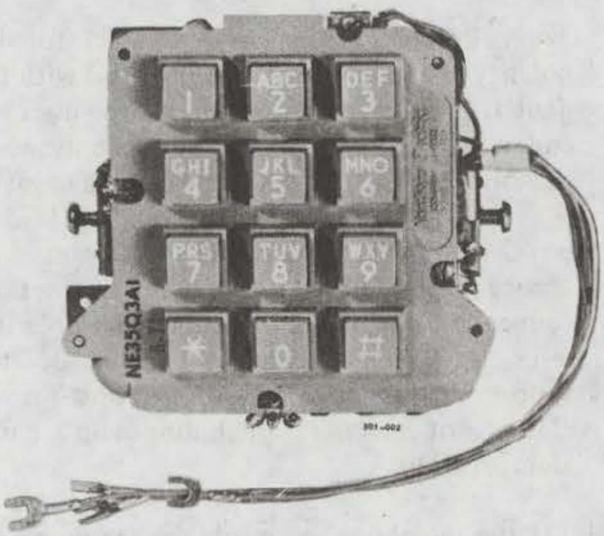

Fig. 1 – NE-35Q3A1 Dial, Front View

2.02 Any pushbutton when depressed will close one low band and one high band frequency contact. These contacts close a path for 2 of the 7 output frequencies of the oscillator (Fig. 2). Continued travel of the button will operate the common switch (Fig. 3). Each button operates a different pair of frequency contacts. For example, when button number 5 is depressed, it selects frequencies of 770 and 1336 hertz simultaneously for transmission to the Central Office (CO). All buttons operate the common switch. The signal

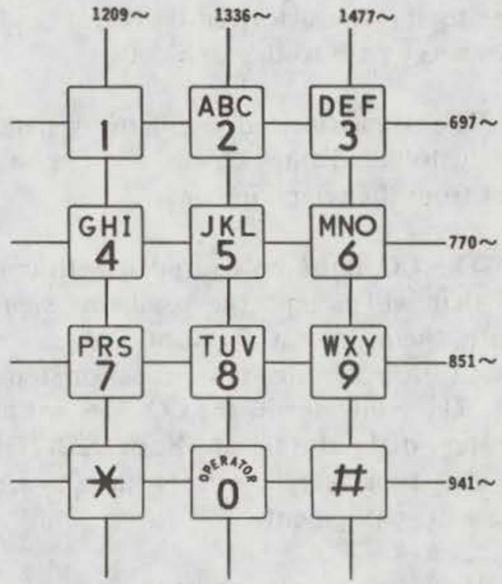

Fig. 2 – Dial Frequencies

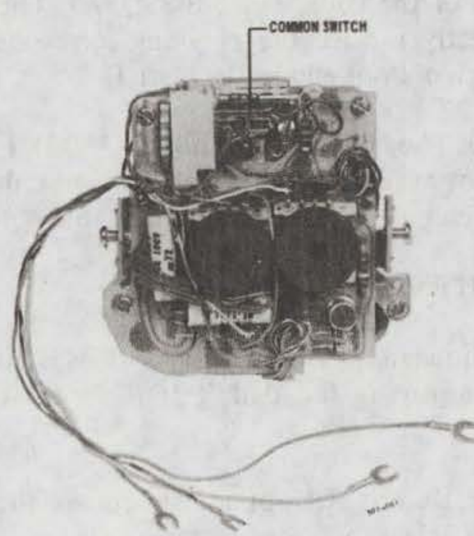

Fig. 3 – NE-35Q3A1 Dial, Rear View

*Trademark of Northern Telecom Limited

will remain on the line as long as the button is depressed.

2.03 The common switch (Fig. 3), when operated, reduces the sidetone to the receiver, opens the transmitter path, applies bias voltage to the transistorized oscillator, and breaks the dc energy path to the tank coils.

2.04 The transistorized oscillator generates the customer dialing signals and is powered by current from the telephone line.

2.05 The CO must be equipped with converters that will accept the oscillator signals and translate them into a 2-out-of-5 digit code for crossbar offices or into dial pulses for step-by-step offices. The converter in the CO does not interfere with rotary dial pulse signals. Both DIGITONE and rotary dial type telephone sets may be served by the same CO equipment.

2.06 Dials of current manufacture contain a polarity guard which permits the dial to function normally when there is battery reversal on the line. These dials are identified with the digit 1 at the end of the code, e.g., NE-35Q3A1. The new codes directly replace the previous corresponding codes which did not end in the digit 1.

Note: The NE-35Q3E1 and NE-35Q3K1 dials are not available with a polarity guard due to their end use requirement. (See Table A.)

3. MAINTENANCE

3.01 Maintenance of NE-35Q type dials is limited to replacing the dial if it is found to be defective.

Note: Do not attempt adjustments of the dial in the field.

3.02 Use the following methods to determine if the dial is defective:

(a) Check for presence of a dialtone. If no dialtone is heard, check the connecting block using either a QSE4 or NE-1011Q type dial hand test set. If a dialtone is heard at the connecting block, check all telephone set components using the appropriate section and replace if defective. If the network is defective, replace the telephone set.

(b) Depress all buttons individually to check for tone feedback. When any button is depressed, two tones should be heard. These tones are blended together but can be identified as two tones. When any two adjacent buttons are depressed simultaneously, only one tone should be heard. Replace the dial if feedback tones are not as described.

(c) Break the dialtone by depressing any button. If dialtone remains restore the line switch to normal and connect a QSE4 or NE-1011Q type dial hand test set across the incoming line terminations of the network. Dial a digit to break the dialtone. If the dialtone can be broken at the network, replace the dial.

Note: Before replacing a dial, check for line polarity if the dial code does not end with the digit 1. NE-35 type dials whose code does not end with the digit 1 will function only when the orange-black (O-BK) dial lead is negative (−) and the red-green (R-G) dial lead is positive (+). This holds true for all classes of service to which the telephone set is connected. To maintain proper dial polarity, refer to the connecting tables in the appropriate section on connections for all classes of service, including tip party identification.

3.03 If the telephone set meets the requirements in 3.02 and the trouble persists, check the CO or Private Branch Exchange (PBX) equipment.

4. CONNECTION FIGURES INDEX

4.01 Schematic diagrams for the NE-35Q type dials are listed on page 4. Fig. 4 to 11 inclusive show schematics of dial codes which are now rated Manufacture Discontinued (MD) while Fig. 12 to 19 inclusive show schematic diagrams for dials of current manufacture.

TABLE A
TYPES OF DIALS

DIAL CODE NUMBER	PUSHBUTTON CHARACTERS*	USES	REMARKS	FIGURE NUMBER
†NE-35Q3A *NE-35Q3A1	Letters and Numbers	General purpose; in single line telephone sets	Has standard common switch and four (4) spade-tipped leads	1,3,4, & 12
†NE-35Q3B †*NE-35Q3B1 (Replaced by NE-35Q3L1)		For use in telephone sets for NE-3 type speakerphone systems, and in NE-1035B3QA station dial	Similar to the NE-35Q3A dial but has an expanded common switch and additional leads	5 13
†NE-35Q3C *NE-35Q3C1		For use in business interphone sets	Similar to the NE-35Q3B dial but has modified circuit	6 14
†NE-35Q3D *NE-35Q3D1		For use in telephone consoles associated with various PBX	Has expanded common switch providing additional functions necessary for use within various PBX	7 15
†NE-35Q3E NE-35Q3E1		For use in coin telephone sets	Similar to the NE-35Q3A dial but has modified circuit for use with coin telephones	8 16
†NE-35Q3F *NE-35Q3F1		For use in a QDD2A dial assembly only	Similar to the NE-35Q3A dial except provides additional switch capacity. Is a dust proof assembly for FM communication	9 17
†NE-35Q3G		For use in NE-2558 type telephone sets	Similar to the NE-35Q3A dial except for physically smaller size	1,4
†NE-35Q3J *NE-35Q3J1		For use in NE-2565QHA telephone sets	Similar to the NE-35Q3B dial except has an additional pair of 'make' contacts	10 18
†NE-35Q3K NE-35Q3K1		For use in coin telephone sets	Similar to the NE-35Q3E dial except expanded common switch and additional leads	11 19
†NE-35Q3L *NE-35Q3L1		For use in QSK2200 telephone set	Used in all sets where NE-35Q3B1 formerly used.	5 13

Note 1: Dials are available in oxford gray only.

Note 2: All dials, except the NE-35Q3L1, are available with or without the word 'operator' spelled out on the button designated '0' and the customer must specify which is required when ordering. The NE-35Q3L1 is not available with the word operator.

† These dials are Manufacture Discontinued (MD)
* These dials are equipped with a polarity guard

Fig. 4 – NE-35Q3A and NE-35Q3G Dials Schematic (MD)
Fig. 5 – NE-35Q3B and NE-35Q3L Dials Schematic (MD)
Fig. 6 – NE-35Q3C Dial Schematic (MD)
Fig. 7 – NE-35Q3D Dial Schematic (MD)
Fig. 8 – NE-35Q3E Dial Schematic (MD)
Fig. 9 – NE-35Q3F Dial Schematic (MD)
Fig. 10 – NE-35Q3J Dial Schematic (MD)
Fig. 11 – NE-35Q3K Dial Schematic (MD)
Fig. 12 – NE-35Q3A1 Dial Schematic
Fig. 13 – NE-35Q3B1 and NE-35Q3L1 Dials Schematic
Fig. 14 – NE-35Q3C1 Dial Schematic
Fig. 15 – NE-35Q3D1 Dial Schematic
Fig. 16 – NE-35Q3E1 Dial Schematic
Fig. 17 – NE-35Q3F1 Dial Schematic
Fig. 18 – NE-35Q3J1 Dial Schematic
Fig. 19 – NE-35Q3K1 Dial Schematic

5. CONNECTION INFORMATION NE-35Q TYPE DIALS

5.01 To replace existing NE-25 and NE-35 type dials with the new NE-35Q type dial proceed as follows:

Note: NE-35Q type dials have no black or green leads.

(a) ***NE-1500DQ1A, -1554BQ1A, -2500DQ1A, and -2554BQ1A Telephone Sets.*** Connect the O-BK, R, W, and R-G leads to the same locations as the existing dial. Move the S-W line switch lead from F to RR on the network.

(b) ***NE-1511, and -2511 Telephone Sets.*** Connect the O-BK, V-W, V-G, R, R-G and W leads to the same locations as the existing dial. Move the S-G, NE-631A key lead from L1 to RR on the network.

(c) ***NE-1558DR, and -2558DR Telephone Sets.*** Connect the R-G, W, R, and O-BK leads to the same locations as the existing dial. Move the S-G pick-up key lead from F to RR on the network.

(d) ***NE-1565, and -2565 Type Telephone Sets*** (other than those listed below). Connect the O-BK, V-W, V-G, R, R-G and W leads to the same locations as the existing dial. The G lead of the NE-636A key should be moved from L2 to RR on the network.

(e) ***NE-1565Q1B, and -2565Q1B Telephone Sets.*** Connect the BL-BK V-G, V-W, R, W, R-G, O-BK, and S leads to the same locations as the existing dial. The S-W line switch lead should be moved from F to RR on the network.

(f) ***NE-2565LQF, and -LQE Telephone Sets.*** Connect to the V-G, O-BK, R-G, R, W, and V-W leads to the same locations as the existing dial. Move the G pick-up key lead from F to RR on the network.

(g) ***NE-1630, -1631, -2630, and -2631 Type Telephone Sets.*** Connect the W, R-G, R, V-G, V-W and O-BK leads to the same locations as the existing dial. Move the V-BL mounting cord lead from terminal 4 on the terminal strip to RR on the network.

(h) ***NE-1634, -1635,-2634, and -2635 Type Telephone Sets.*** Connect the W, R-G, R, V-G, V-W and O-BK leads to the same location as the existing dial. Move the W-BL mounting cord lead from terminal 4 on the terminal strip to RR on the network.

(i) ***NE-1,-2,-3,-4, QCN3 and QCN4 Type Consoles.*** Connect the W, R-G, R, BL-BK, O, G-W, V-BL, and O-BK leads to the same location as the existing dial. Connect a jumper between terminals 1 and 7 of the dial assembly terminal strip.

(j) ***NE-1236, and -2236 Q Type Coin Telephones.*** Connect the BL, W, R, R-G, O-BK and O-R leads to the same location as the existing dial. Connect a jumper between C on the network and 6 on the terminal strip.

(k) ***NE-2565QHA Telephone Set***. Connect dial leads as follows:

R-G	R of network
R	Y of network
V-G	G of network
W	RR of NE-636QM Key
V-W	SG of NE-636QM Key
BK	6 of NE-636QM Key
G	ON1 of NE-636QM key
O-BK	C of network

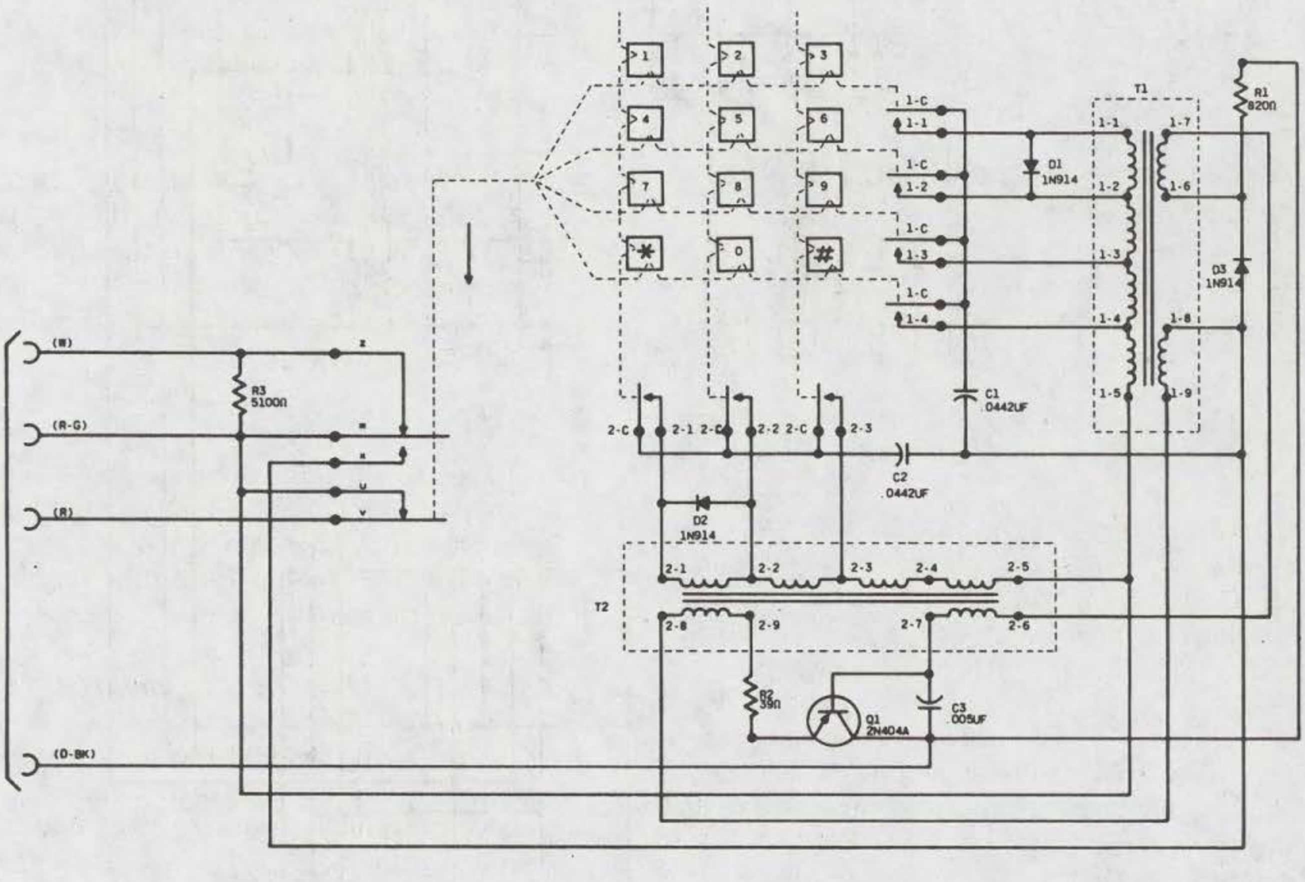

Fig. 4 – NE-35Q3A and NE-35Q3G Dials Schematic (MD)

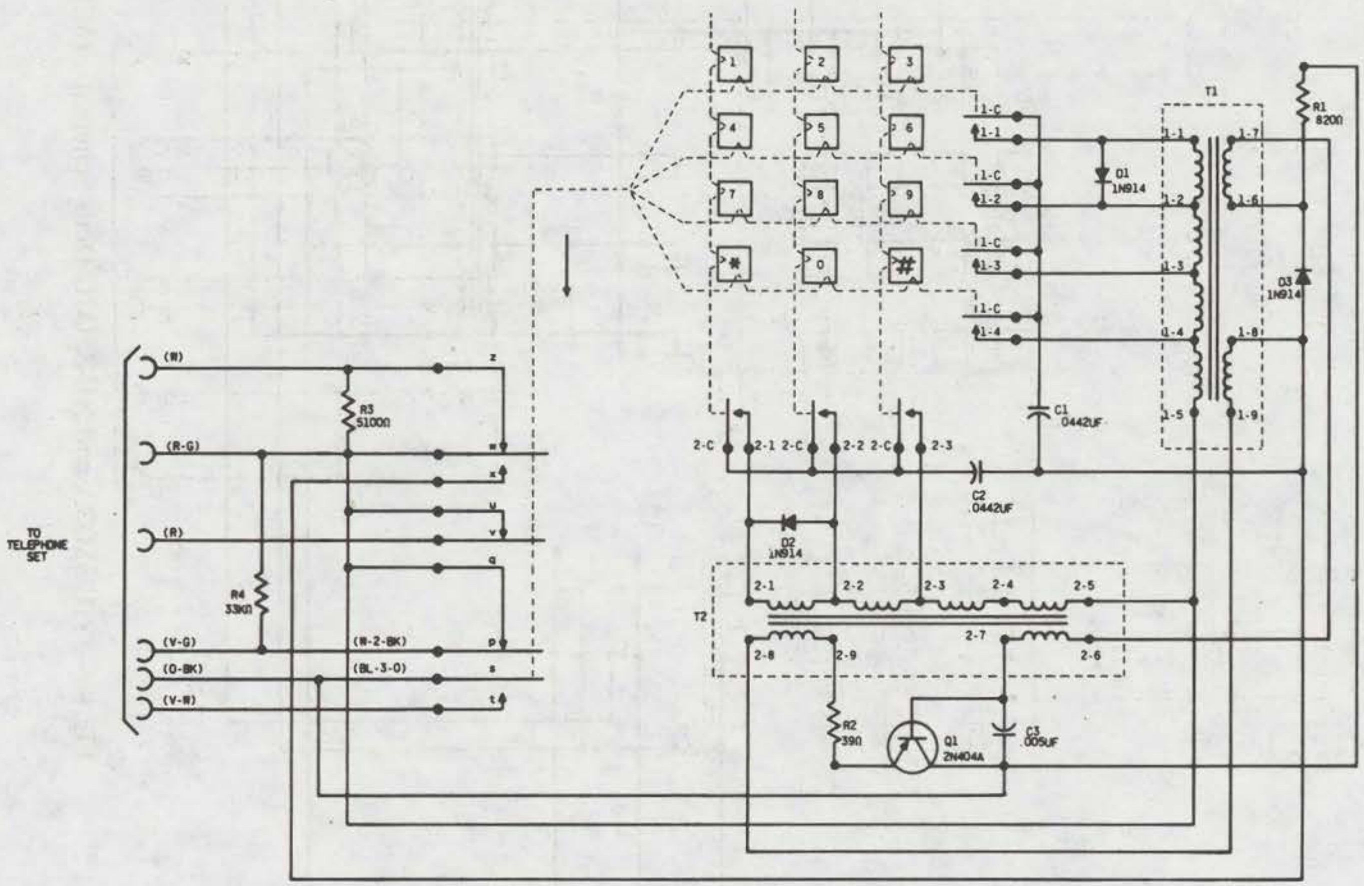

Fig. 5 – NE-35Q3B and NE-35Q3L Dials Schematic (MD)

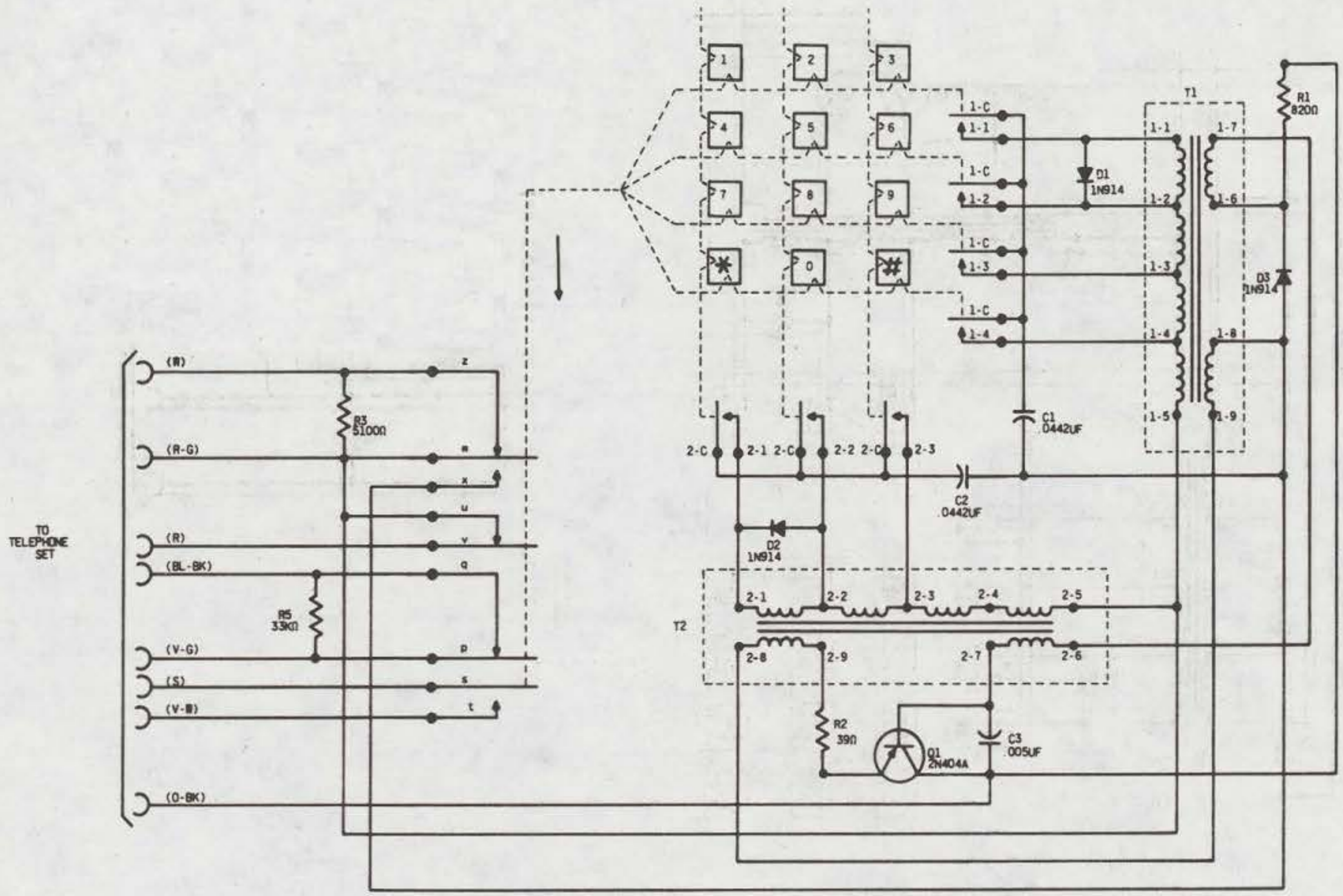

Fig. 6 – NE-35Q3C Dial Schematic (MD)

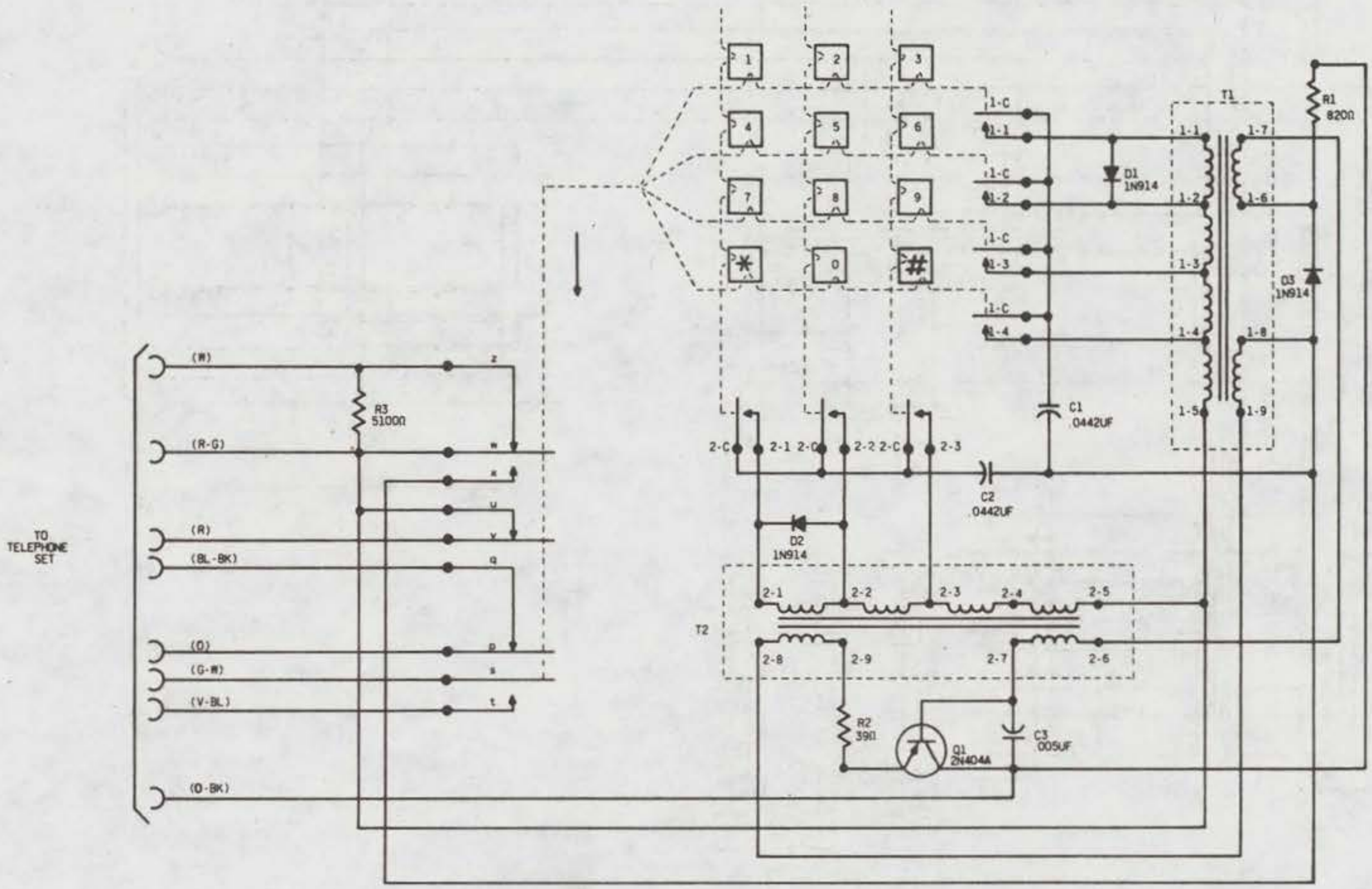

Fig. 7 – NE-35Q3D Dial Schematic (MD)

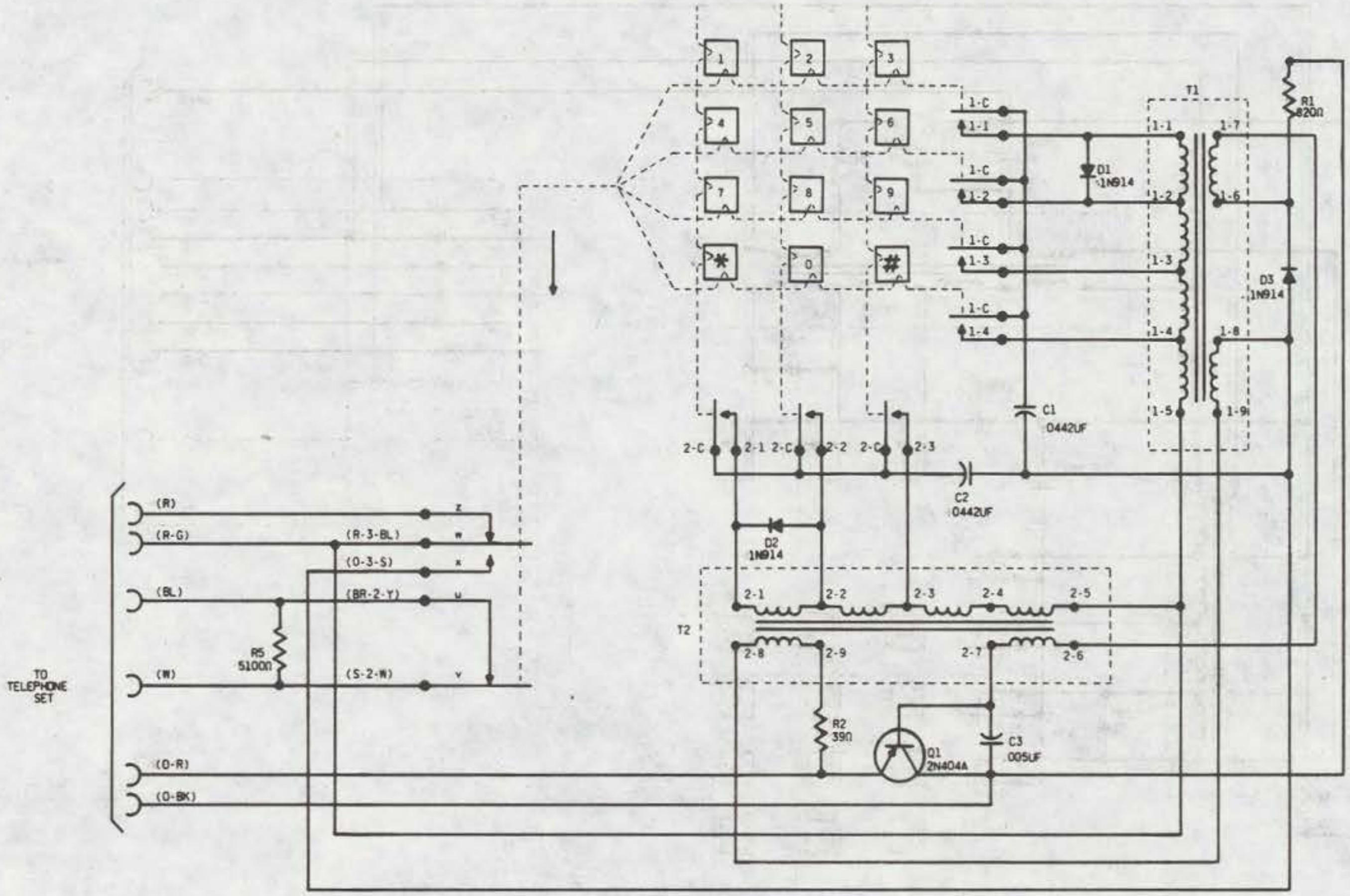

Fig. 8 – NE-35Q3E Dial Schematic (MD)

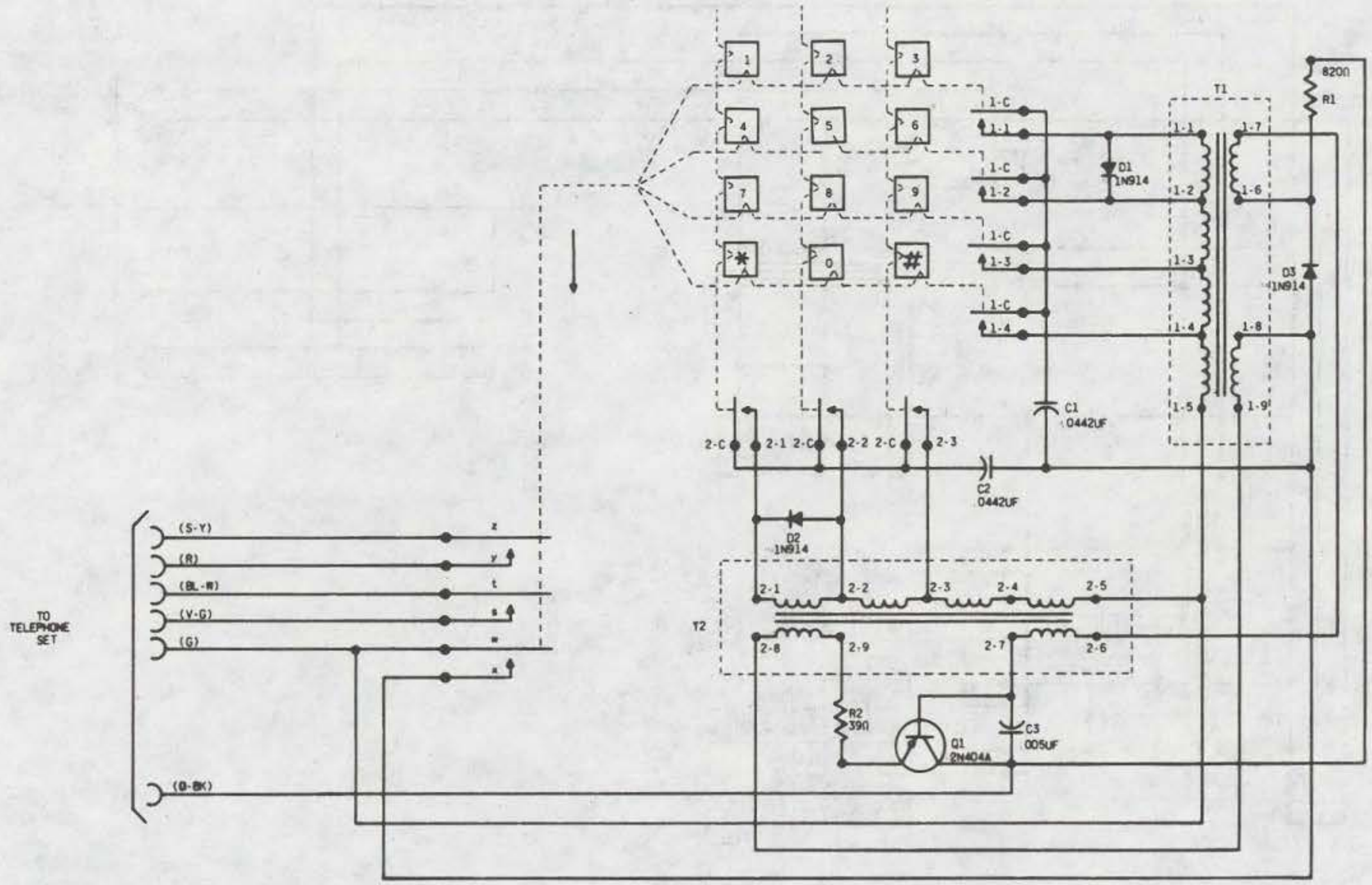

Fig. 9 – NE-35Q3F Dial Schematic (MD)

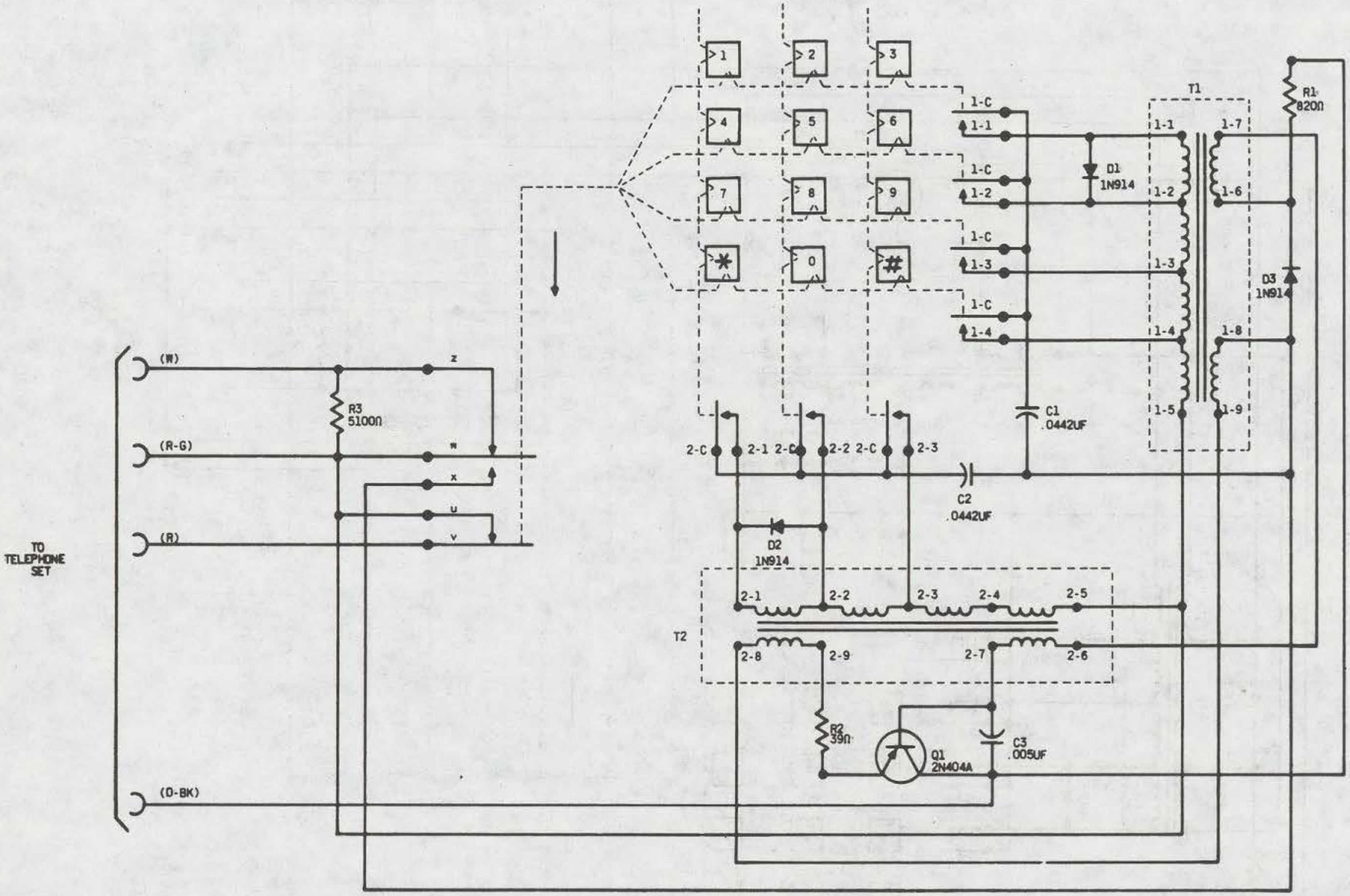

Fig. 10 – NE-35Q3J Dial Schematic (MD)

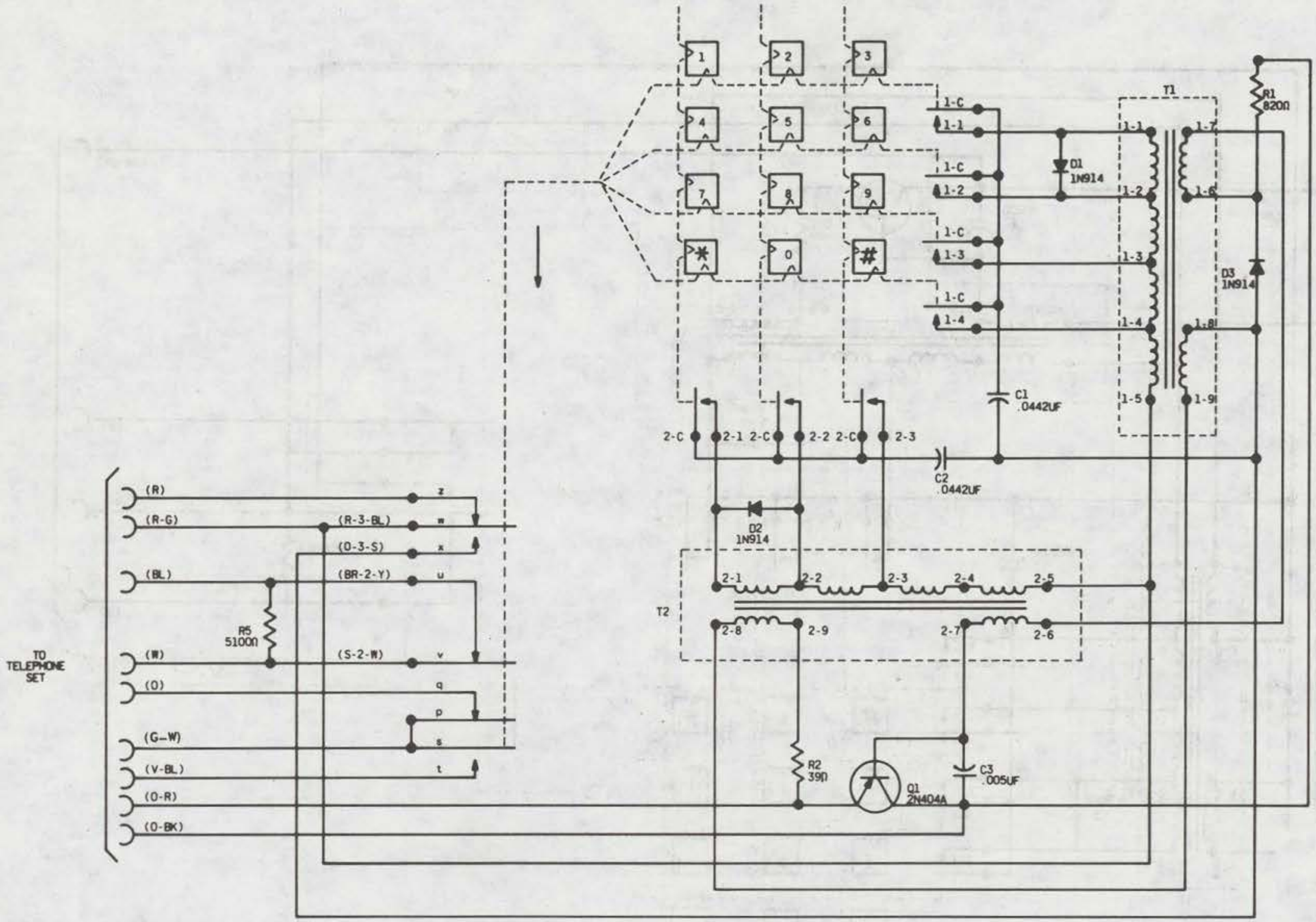

Fig. 11 – NE-35Q3K Dial Schematic (MD)

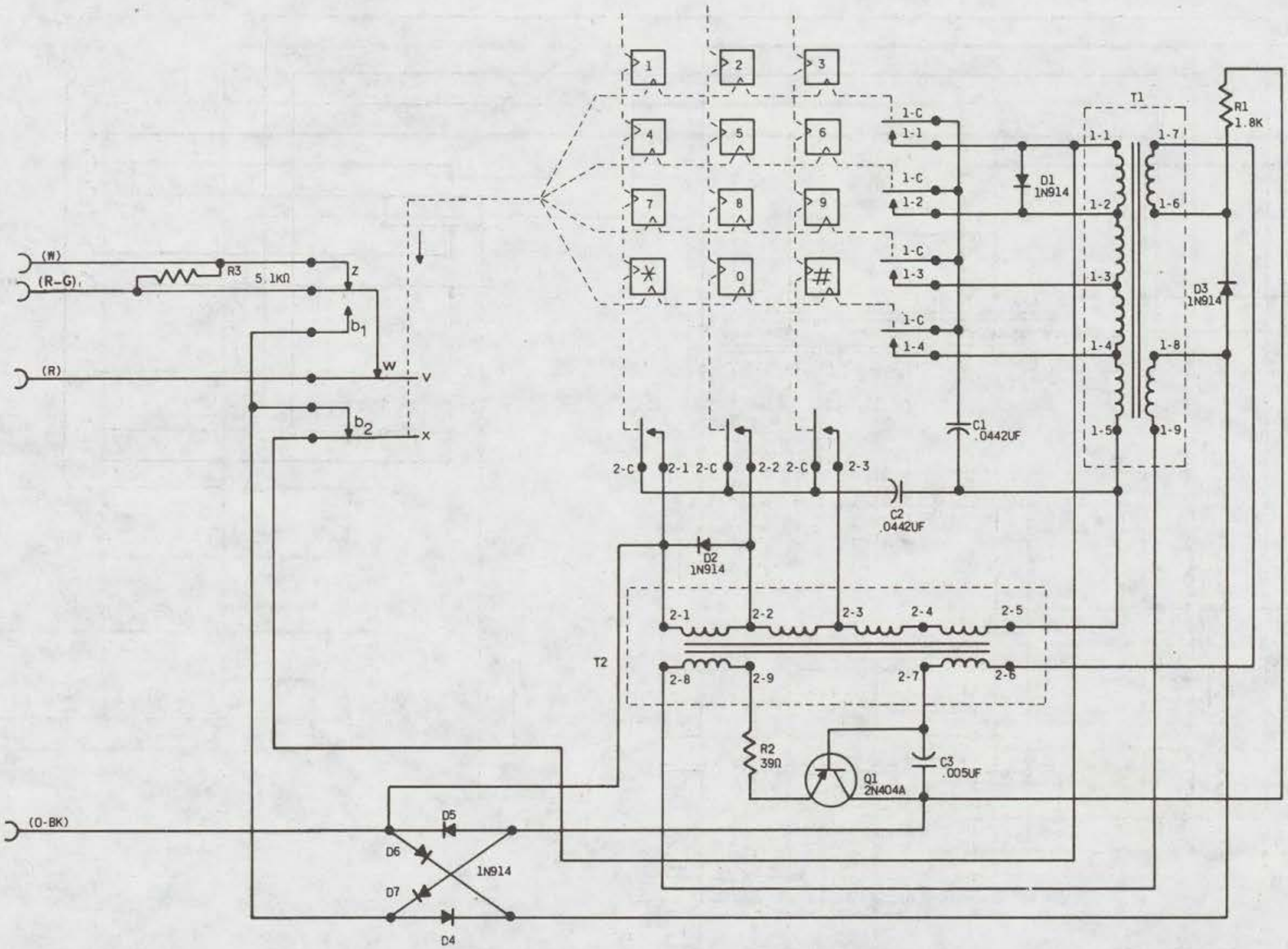

Fig. 12 – NE-35Q3A1 Dial Schematic

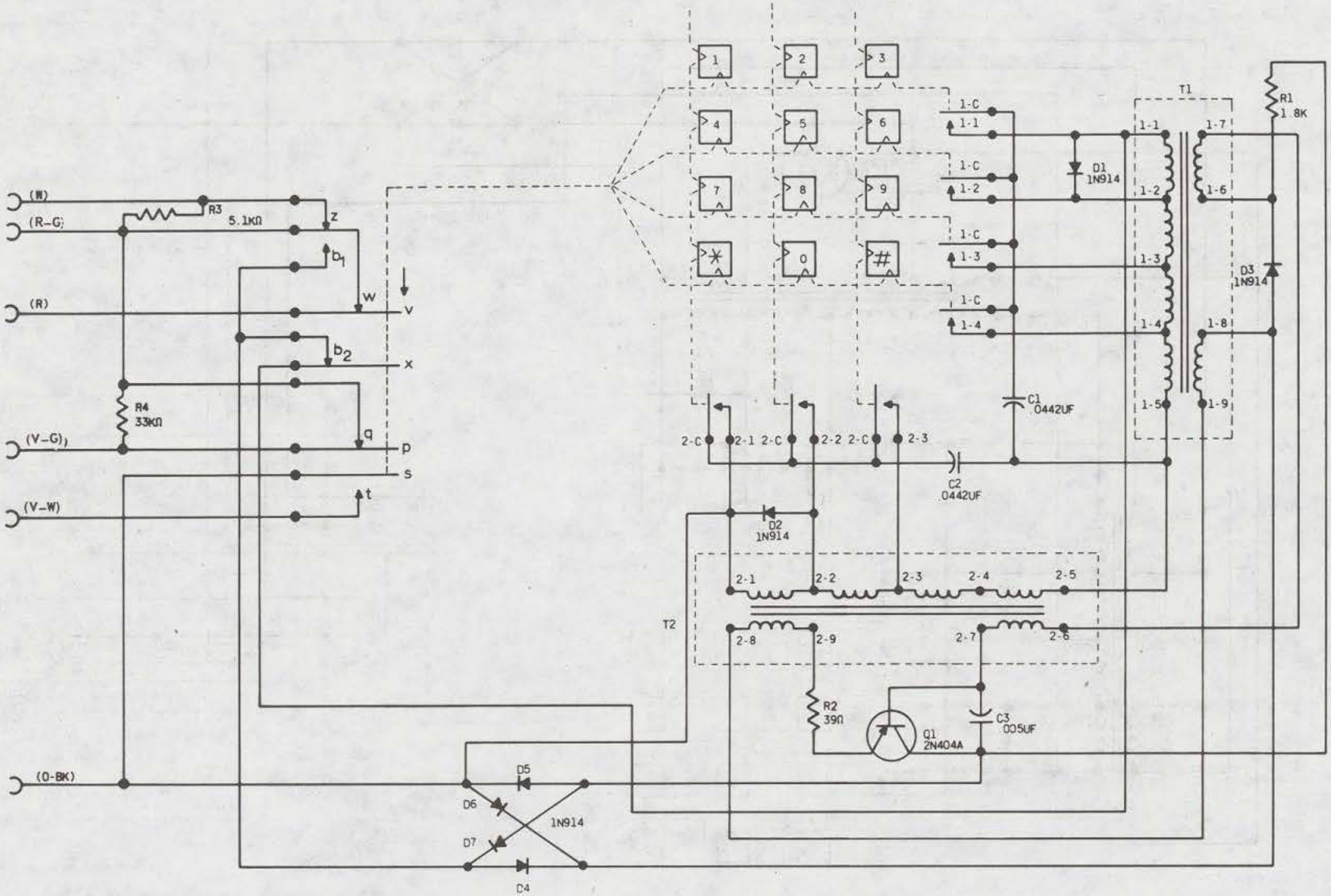

Fig. 13 – NE-35Q3B1 and NE-35Q3L1 Dials Schematic

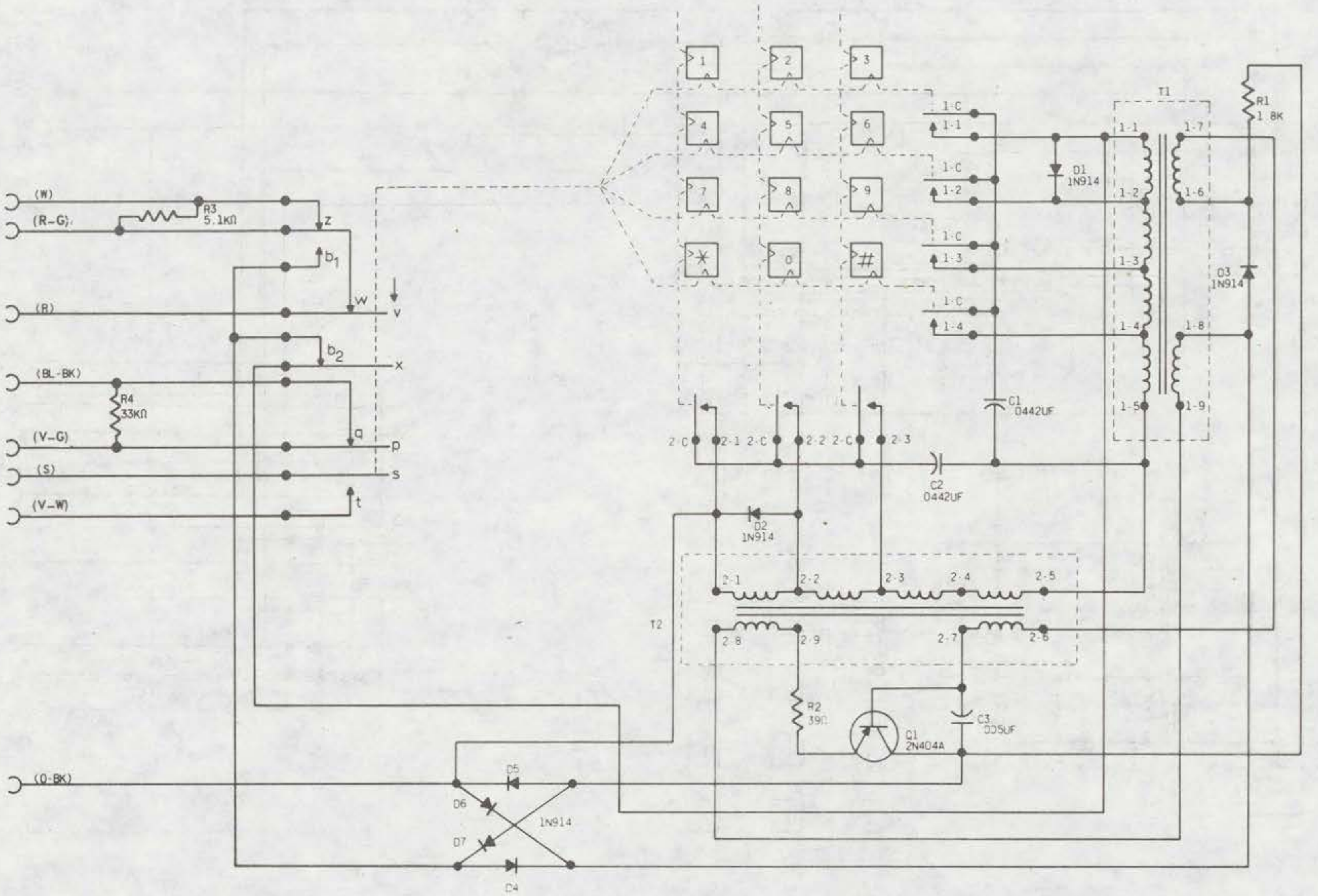

Fig. 14 – NE-35Q3C1 Dial Schematic

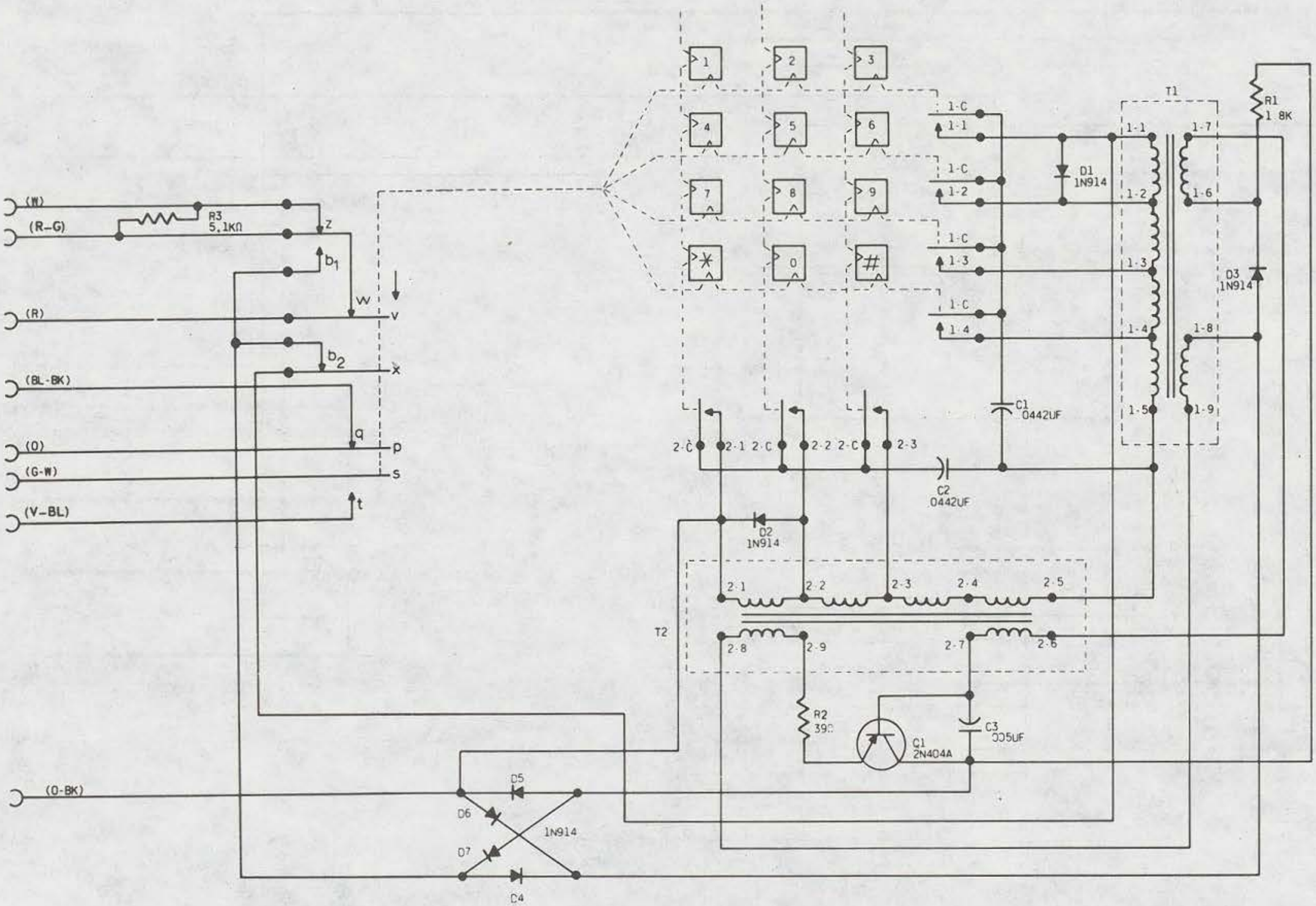

Fig. 15 – NE-35Q3D1 Dial Schematic

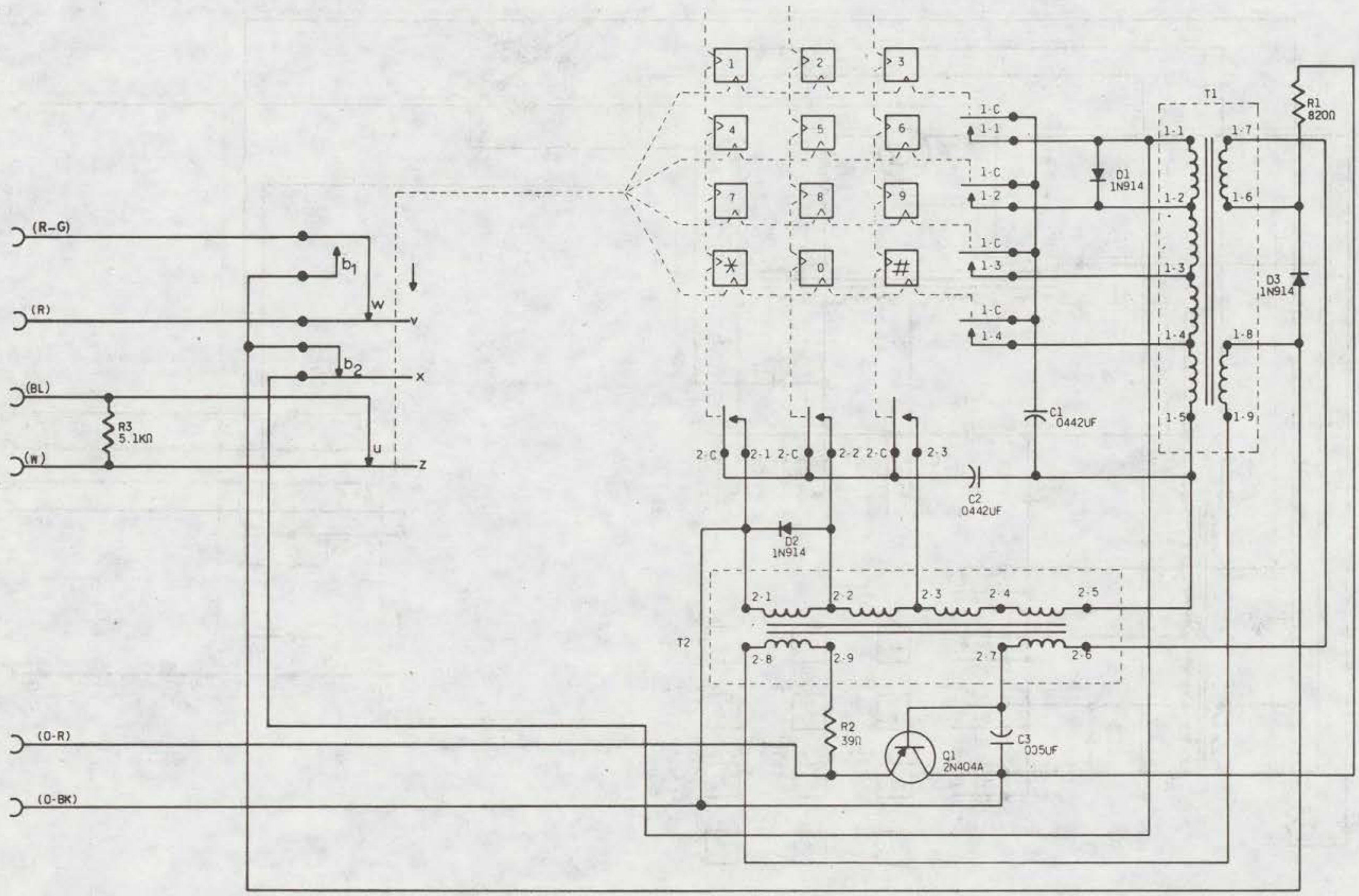

Fig. 16 – NE-35Q3E1 Dial Schematic

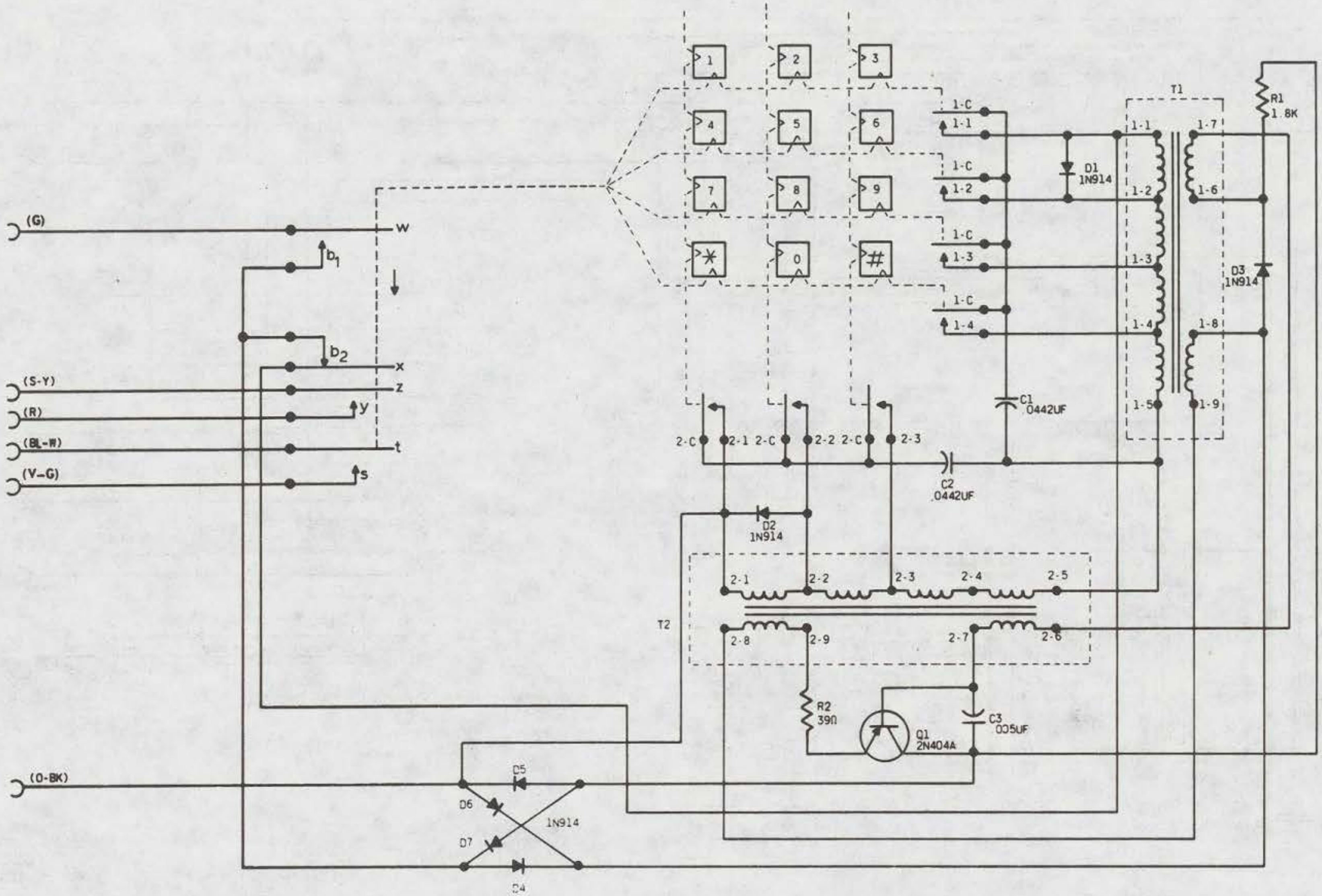

Fig. 17 – NE-35Q3F1 Dial Schematic

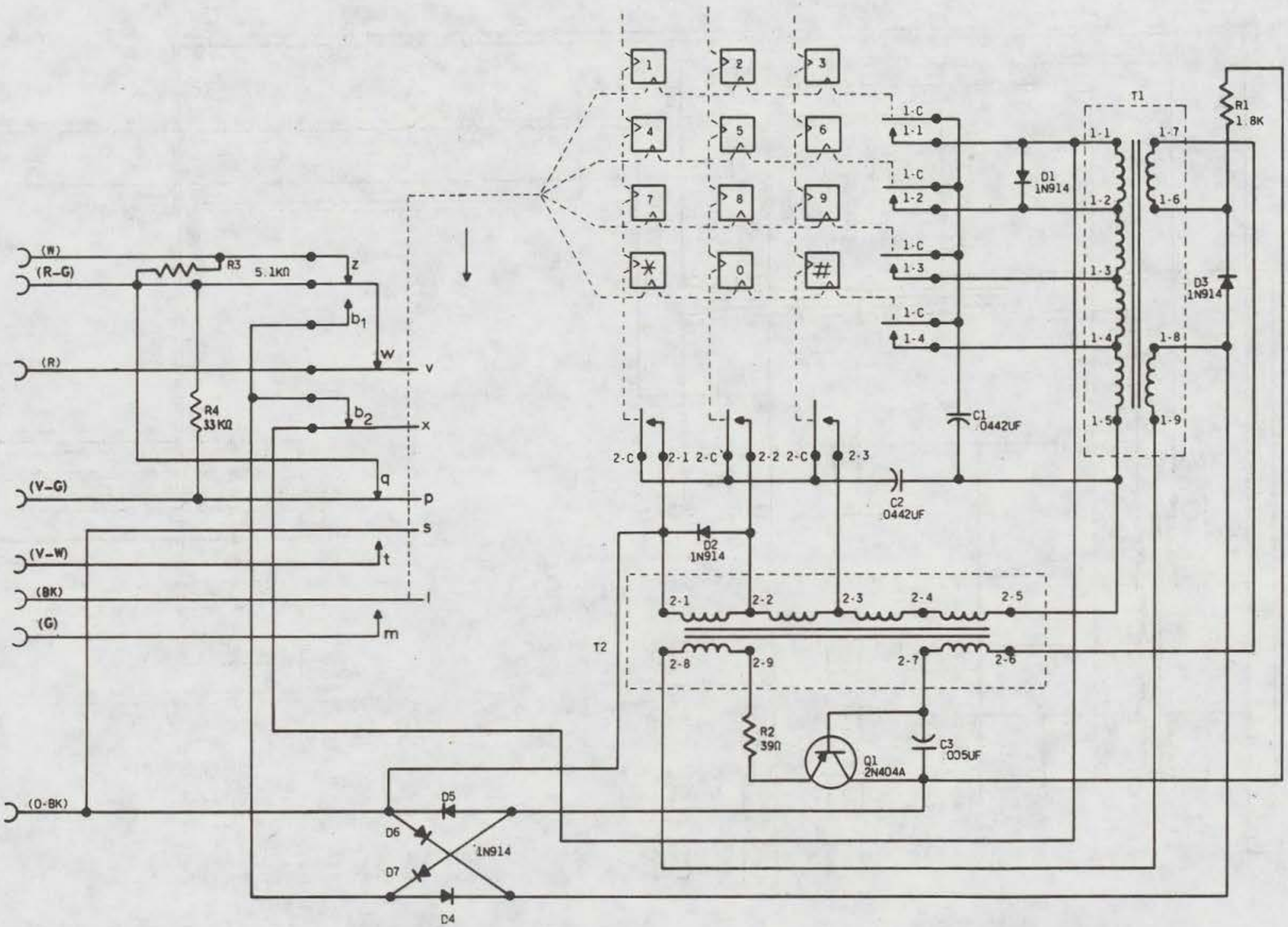

Fig. 18 – NE-35Q3J1 Dial Schematic

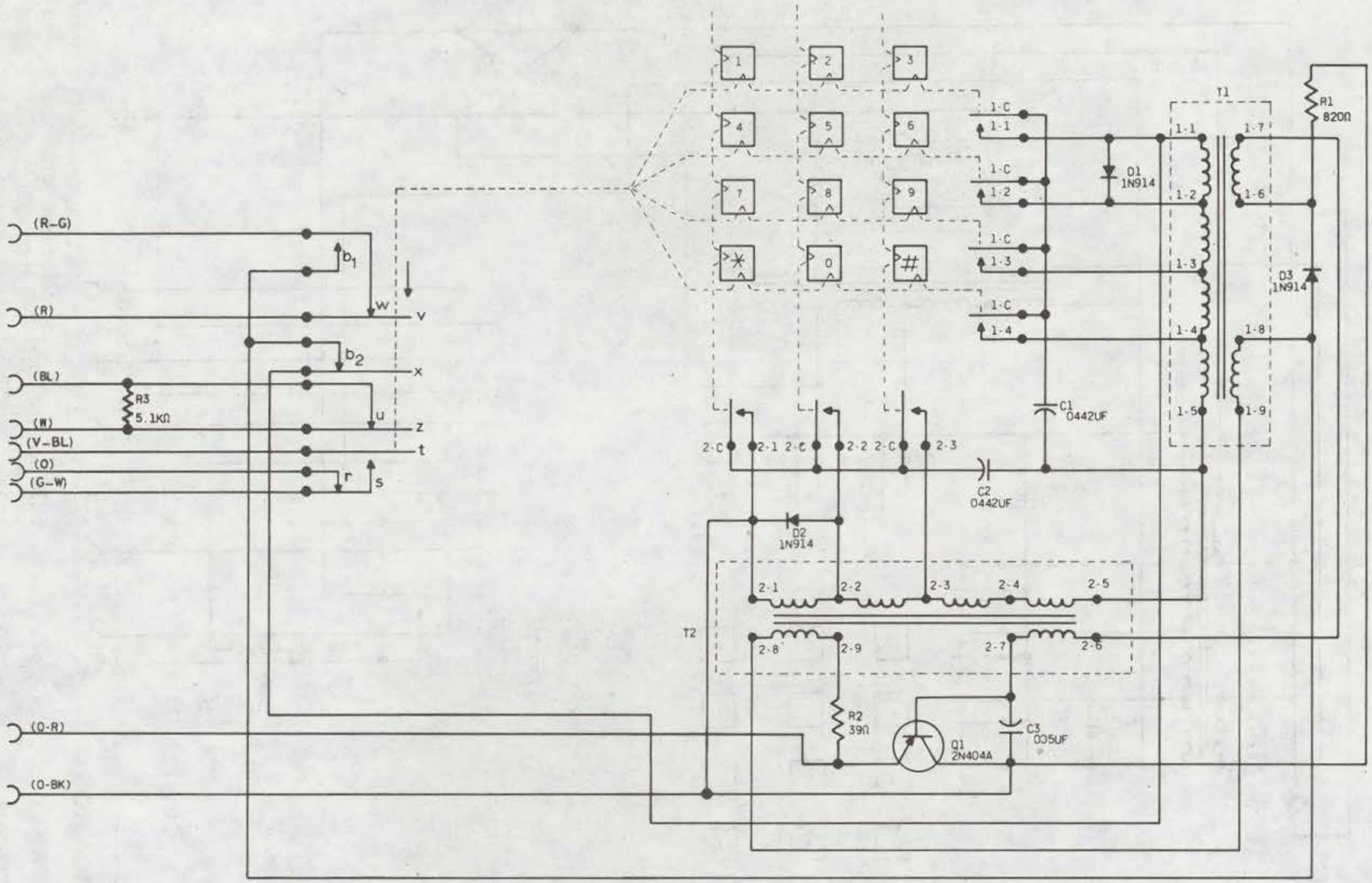

Fig. 19 – NE-35Q3K1 Dial Schematic

STATION DIALS
DIGIPULSE* TYPE
IDENTIFICATION, MAINTENANCE, AND CONNECTIONS

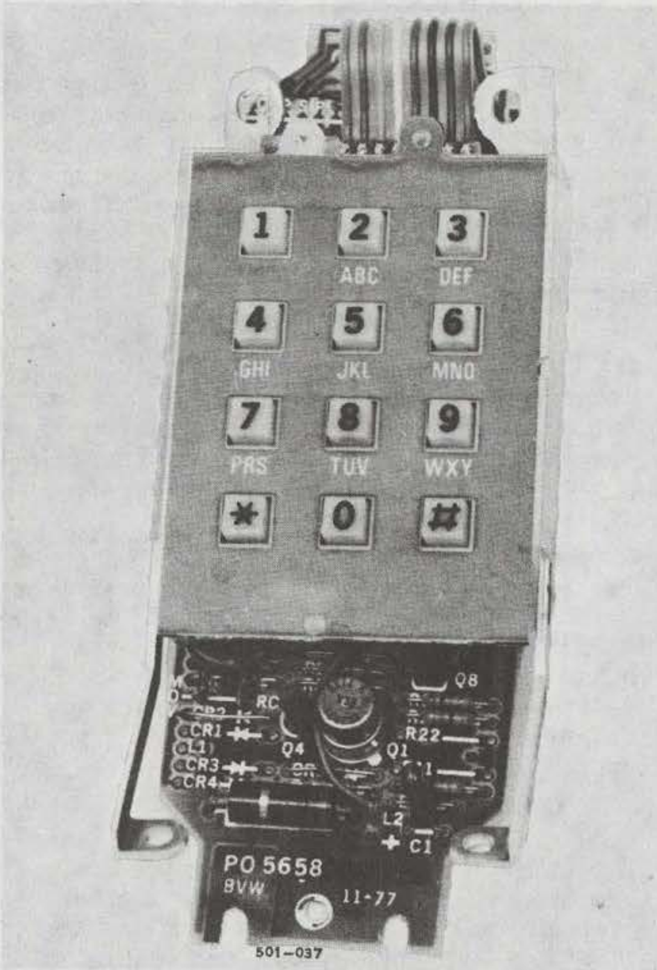

Fig. 1 — NE-35Q Type

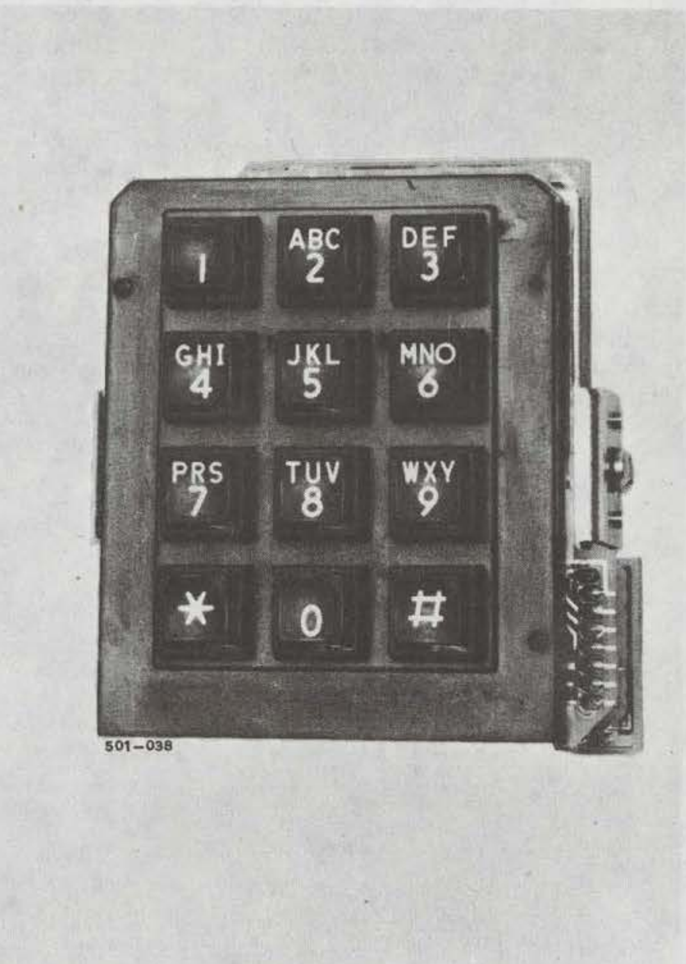

Fig. 2 — QDC3 Type

CONTENTS PAGE

1. GENERAL 1225
2. IDENTIFICATION 1226
3. MAINTENANCE 1226
4. CONNECTIONS 1226

1. GENERAL

1.01 This section provides information for the identification, maintenance, and connection of the NE-35Q type and the QDC3-type DIGIPULSE dials which are used in single-line and multiline sets.

* Trademark of Northern Telecom Limited

2. IDENTIFICATION

2.01 The NE-35Q type and the QDC3-type DIGIPULSE dials (Fig. 1 and 2) are pushbutton, pulse-output dials with an interdigital pause of 800 ms nominal.

2.02 It is not necessary for a digit to be completely outpulsed before operating the next button. The user may push the keyboard buttons up to 10 operations per second because the number sequence is stored in a 16-digit electronic memory, and automatically outpulsed with the correct timing. Outpulsing begins within 200 ms after the first button is operated.

2.03 These dials can be reinitiated with an on-hook/off-hook sequence of a minimum of 300 ms.

2.04 Operating the sextile (✱) button (Fig. 3) inserts a pause of approximately 2 seconds into the dialing sequence. Operating the octothorpe (#) button initiates the last number redial feature on telephone sets which have been converted to include this optional feature.

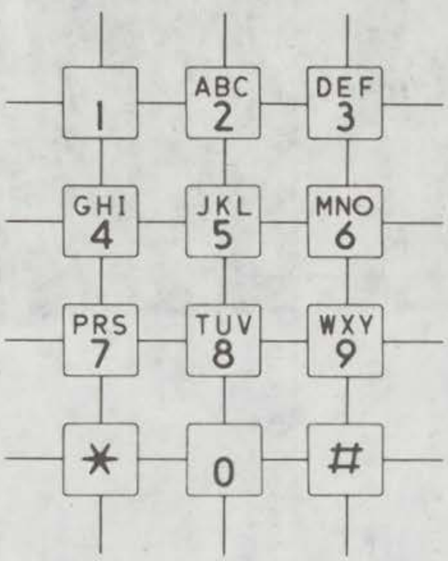

Fig. 3 — Button Configuration

2.05 These dials are powered by line current from the telephone set. When the set is on-hook, the dc resistance is 500kΩ minimum.

Note: If the telephone set is equipped with the last number redial option, additional power supplied by an NE-2012B transformer through an NE-D3QBA line cord is required.

2.06 For information on the end use and operational characteristics of specific dial codes, see Table A.

3. MAINTENANCE

3.01 Maintenance of these dials is limited to replacing the dial, if it is found to be defective.

Note: Do not attempt to repair or adjust the dial in the field.

3.02 Use the following methods to determine if the dial is defective.

(a) Check for the presence of a dial tone. If no dial tone is heard, check at the connecting block using a QSE4-type or NE-1011Q type dial hand test set. If a dial tone is heard at the connecting block, check all telephone set components (referring to the appropriate section) and replace if defective. If the network is defective, replace the telephone set.

(b) Depress all buttons individually. When any button, excluding the sextile and octothorpe buttons, is depressed, muted dial pulses should be heard in the receiver. Replace the dial, if muted dial pulses are not heard.

(c) Break the dial tone by depressing any numbered button. If dial tone remains, restore the line switch to normal and connect a QSE4-type or NE-1011Q type dial hand test set across the incoming line terminations of the network. Dial a digit on the dial hand test set to break dial tone. If dial tone can be broken at the network, replace the dial.

Note: Before replacing dial, check for line polarity if the dial is not equipped with a polarity guard. The tip side of the line must be positive. This holds true for all classes of service. To maintain proper dial polarity, refer to the connection tables in the appropriate section. Dials equipped with polarity guard (see Table A) will operate when tip is either positive or negative.

3.03 If the telephone set meets the requirements in 3.02 and the trouble still persists, check the CO or PBX equipment.

4. CONNECTIONS

4.01 Schematic diagrams are shown in Fig. 4 through 12 and associated component is listed in Table B.

TABLE A
NE-35Q AND QDC3 TYPE DIAL FEATURES

DIAL CODE	USE	POLARITY GUARD	LAST NUMBER REDIAL OPTION (Note)	REMARKS	SCHEMATIC FIG.
NE-35QA (MD)	General Purpose: NE-500 type single-line, residential telephone sets.				4
NE-35QA1 (MD)				Same as NE-35QA except one less dial lead.	5
NE-35QB	General Purpose: Single-line telephone sets, also multiline telephone sets (NE-35QB1) if polarity guard is required.		X		6
NE-35QB1		X	X		7
⊡ NE-35QC1	General Purpose: Export telephone sets.		X	Percent break is 67 instead of standard 62.	8
NE-35QE	General Purpose: Multiline telephone sets.		X	If polarity guard required are NE-35QB1.	9
QDC3A (MD)	General Purpose: CONTEMPRA* single-line.				10
QDC3B	General Purpose: CONTEMPRA single-line telephone sets.			Used where last number redial option not required.	11
QDC3B1		X			12
QDC3B2	QSK3100R and QSK3100F CONTEMPRA single-line telephone sets.	X	X (Note)		13
QDC3B3	QSK3100P and QSK3100E CONTEMPRA single-line telephone sets.		X (Note)		14
⊡ QDC3C2	General Purposes: CONTEMPRA export telephone sets.			Percent break is 67 instead of standard 62.	15

Note: For sets equipped with NE-35Q type dials, a P0585142 Kit, an NE-2012B Transformer and an NE-D3Q8A Line Cord must be ordered separately to enable the "Last Number Redial" option. CONTEMPRA set equipped with QDC3B2 and QDC3B3 are shipped complete with the kit installed and require only an NE-2012B Transformer to be ordered separately. For information on specific set codes refer to the appropriate section.

(MD) – Manufacturer Discontinued.

⊡ Not required by Bell Canada.

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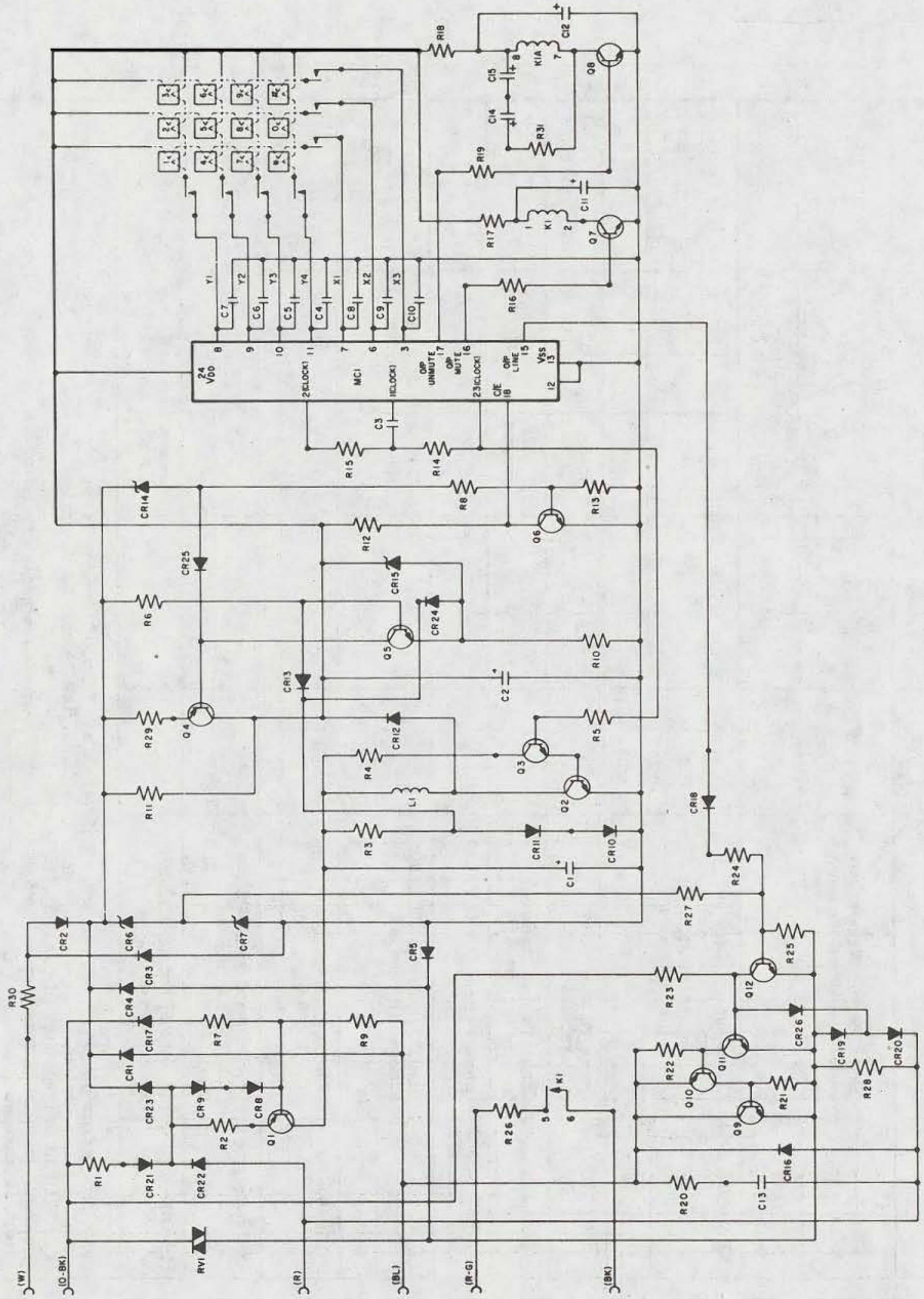


Fig. 4 — NE-35QA Dial (MD) Schematic

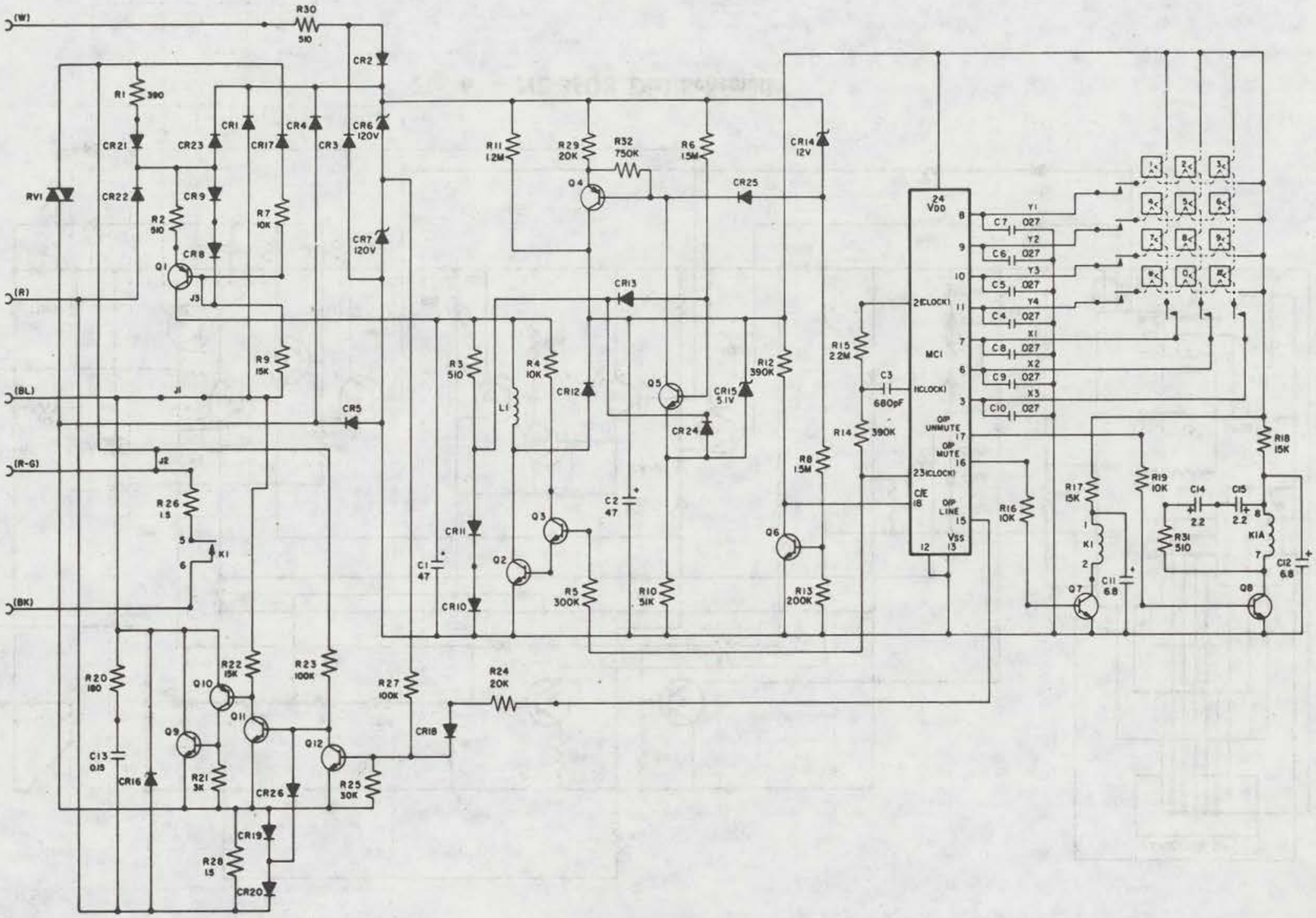


Fig. 5 — NE-35QA1 Dial (MD) Schematic

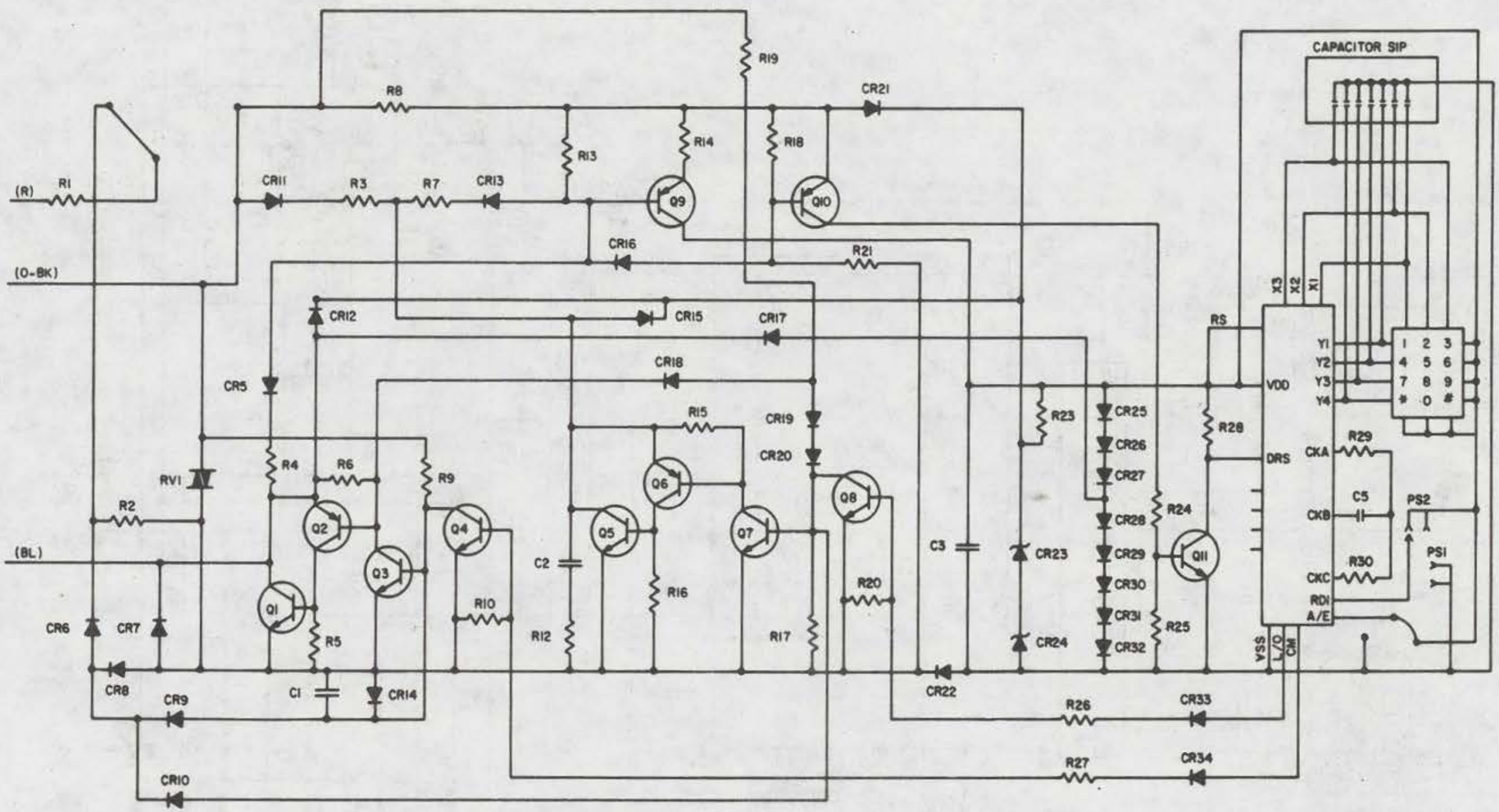
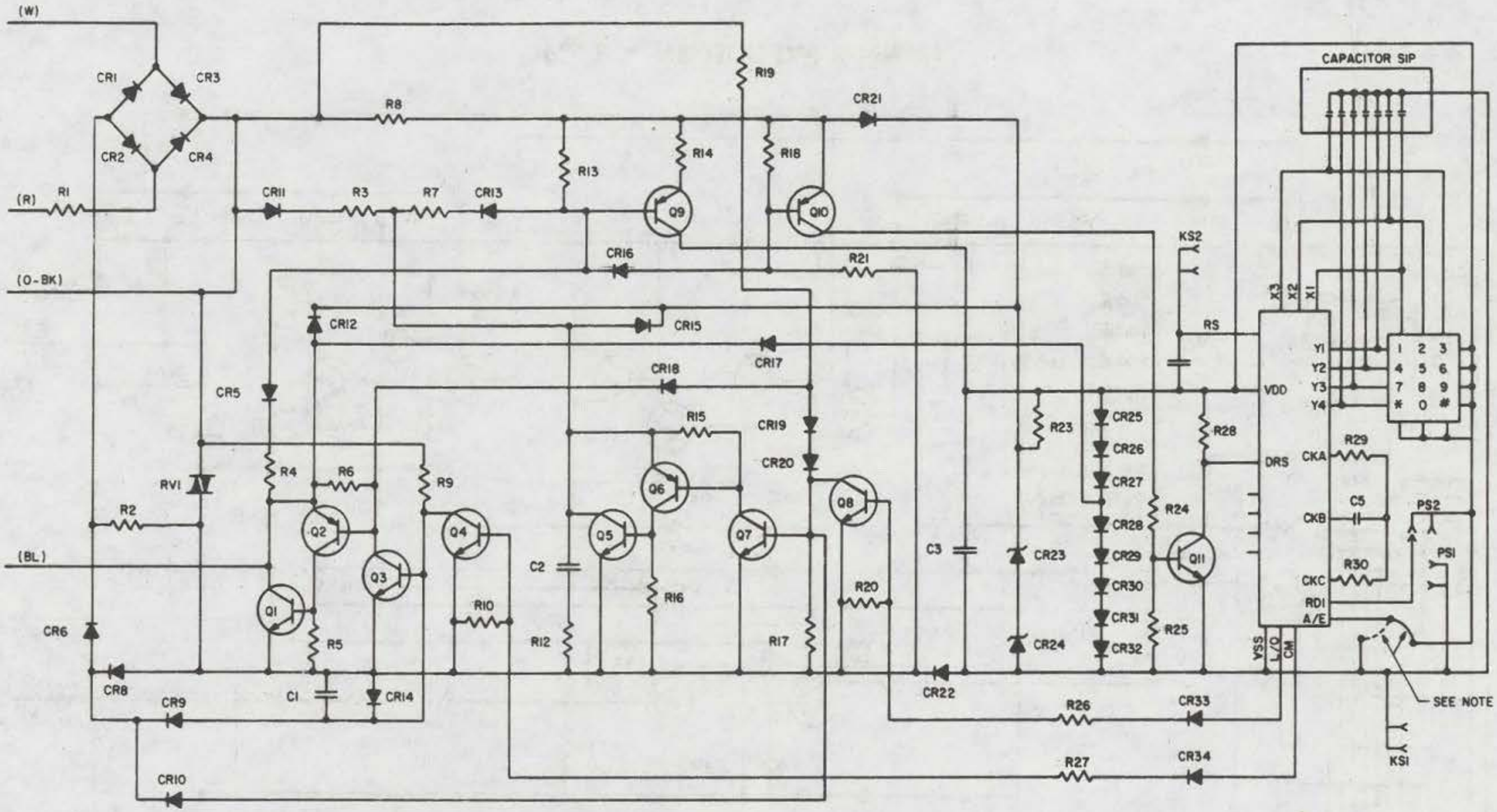


Fig. 6 — NE-35QB Dial Schematic



NOTE - THE JUMPER, IN THE POSITION ILLUSTRATED BY THE SOLID LINE, IS FOR THE NE-35QB1 DIGIPULSE DIAL. SHOWN IN THE POSITION ILLUSTRATED BY THE DOTTED LINE, THE JUMPER IS FOR THE NE-35QC1 DIGIPULSE DIAL.

Fig. 7 — NE-35QB1 and NE-35QC1 Dial Schematic

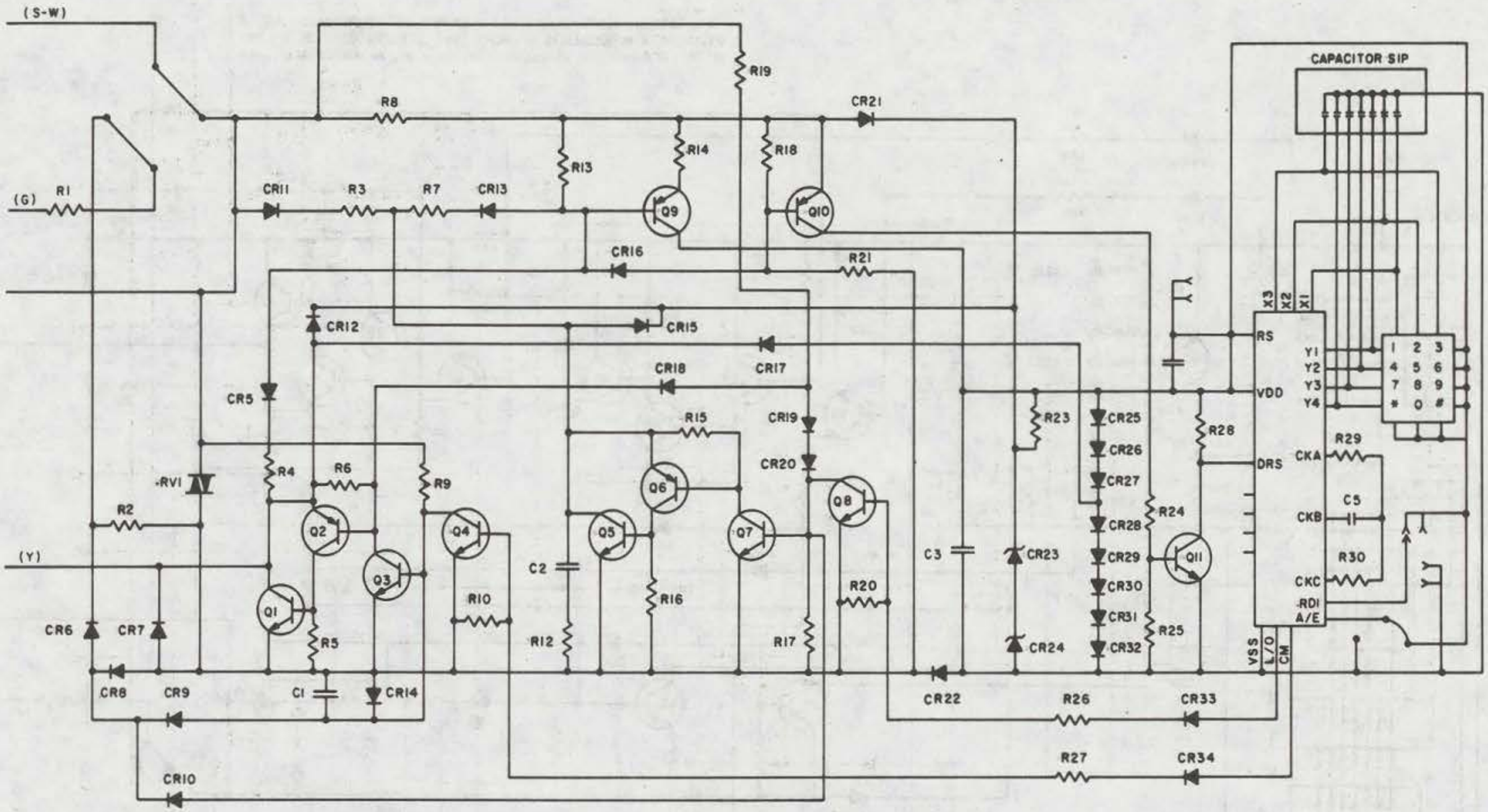


Fig. 8 — NE-35QE Dial Schematic

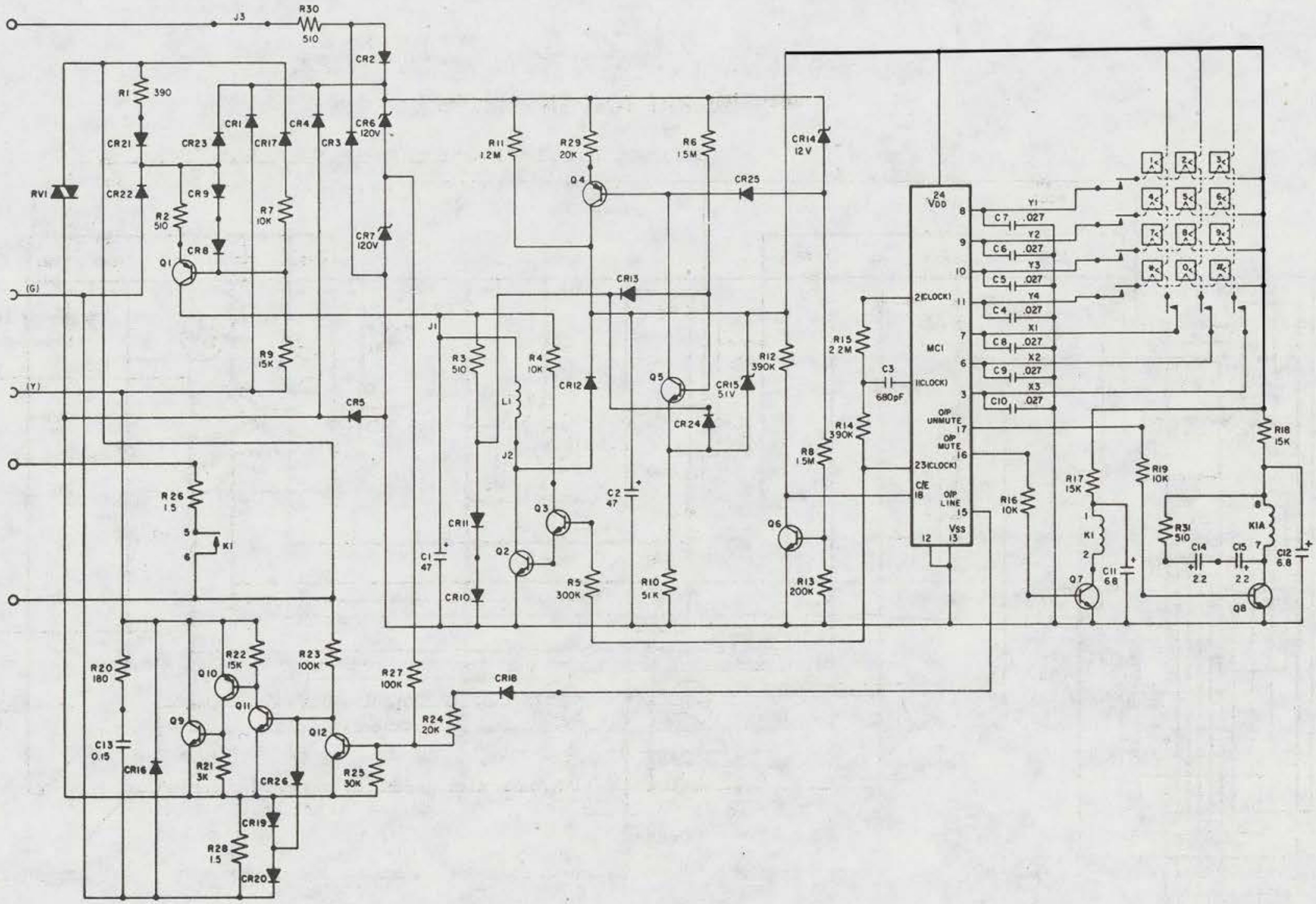
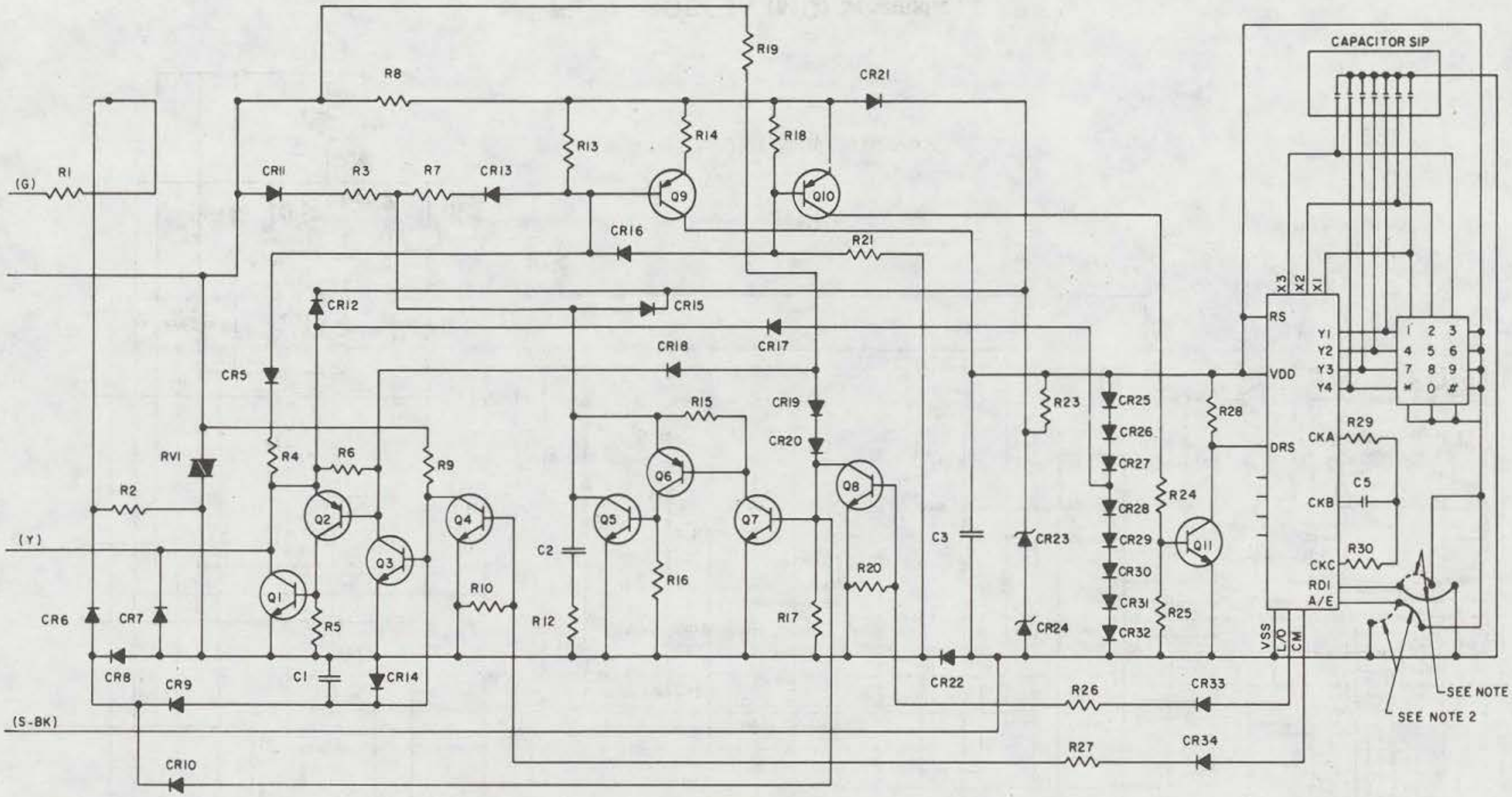


Fig. 9 — QDC3A (MD) Schematic



NOTE 1 - THE JUMPER IN THE POSITION ILLUSTRATED BY THE SOLID LINE IS FOR THE QDC3B DIGIPULSE DIAL. SHOWN IN THE POSITION ILLUSTRATED BY THE DOTTED LINE, THE JUMPER IS FOR THE QDC3B3 AND QDC3C2 DIGIPULSE DIAL.

NOTE 2 - THE JUMPER IN THE POSITION ILLUSTRATED BY THE SOLID LINE IS FOR THE QDC3B AND QDC3B3 DIGIPULSE DIALS. SHOWN IN THE POSITION ILLUSTRATED BY THE DOTTED LINE, THE JUMPER IS FOR THE QDC3C2 DIGIPULSE DIAL.

Fig. 10 – QDC3B, QDC3B3, and QDC3C2 Dial Schematic

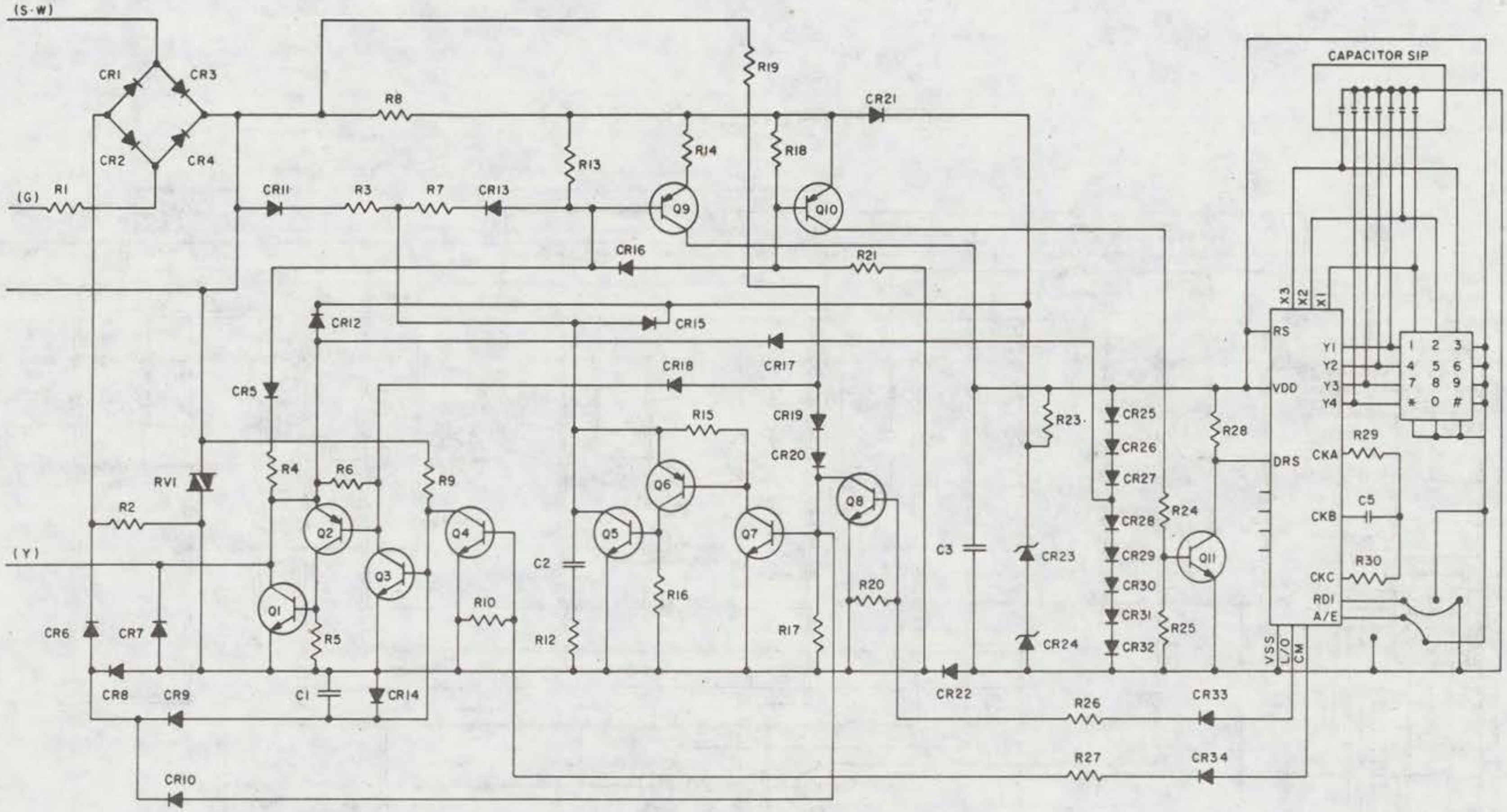


Fig. 11 — QDC3B1 Dial Schematic

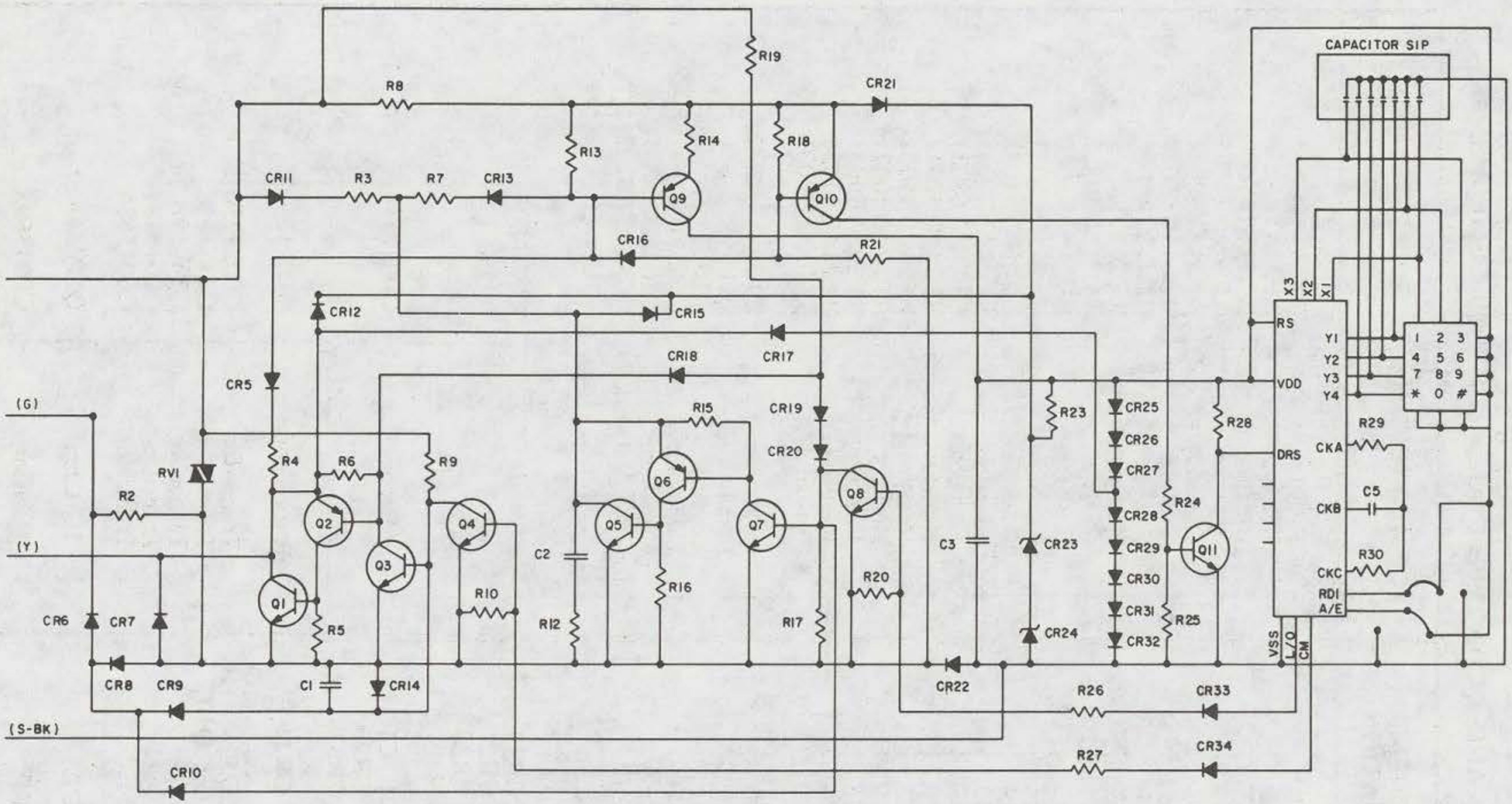


Fig. 12 — QDC3B2 Dial Schematic

TABLE B
NE-35Q AND QCD3 TYPE DIALS — LIST OF COMPONENTS

COMPONENT DESIGNATION	COMPONENT	PART NUMBER
R1	Resistor	RC13Y100J
R2	Resistor	RF24AY1R50J
R3	Resistor	RC14Y161J
R4, R7	Resistor	RF24AY1002J
R5, R16	Resistor	RF24AY3001J
R6	Resistor	RF24AY1502J
R8	Resistor	RC11Y391J
R9, R19	Resistor	RC11Y204J
R10, R15, R20	Resistor	RF24AY3002J
R12	Resistor	RF24AY1800J
R13	Resistor	RF24AY1003J
R14	Resistor	RF24AY5100J
R17	Resistor	RF24AY2003J
R18, R24	Resistor	RF24AY6803J
R21, R25	Resistor	RF24AY1004J
R23	Resistor	RF24AY1503J
R26, R27	Resistor	RF24AY2002J
R28	Resistor	RF24AY3903J
R29	Resistor	RF24AY4703J
R30	Resistor	RF05AQ1403F
C1	Capacitor	CTS04Y335M25
C2	Capacitor	C0045682
C3	Capacitor	CTS04Y226M10
C4	Capacitor	C0039172
C5	Capacitor	CS01X1001G100
C6-C12	Capacitor Network	NC02X09B273M
CR1-CR8, CR11-CR13 CR15, CR17 CR19, CR21 CR22, CR33 CR34	Diode	C0046804
CR9, CR10, CR14 CR16, CR20 CR25-CR32	Diode	C0037336
CR23, CR24	Zener Diode	QDK16A
Q1, Q5	Transistor	C0037250
Q2, Q6, Q9, Q10	Transistor	QTW19B
Q3, Q7	Transistor	QTW19A
Q4, Q8	Transistor	C0045689
Q11	Transistor	C0045686
MC1	IC Chip	QMV54AP5
RV1	Varistor	C0045693

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