TECHNICAL MANUAL

TELEGRAPH TEST CODER TYPE TDA-10

B101/0361

Issue No. 2

Jan. 1962

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Bridgnorth - Shropshire - England

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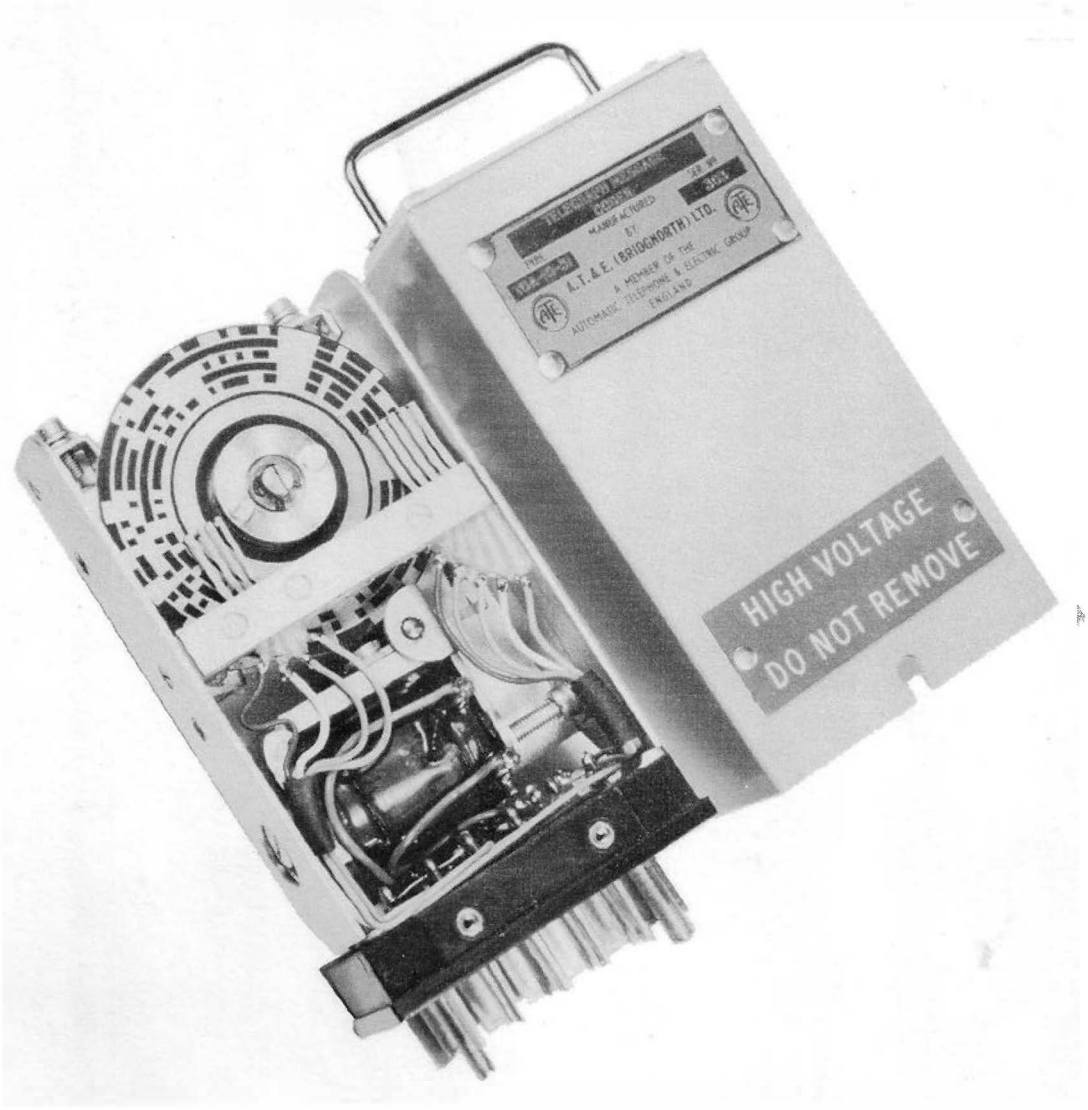

TELEGRAPH TEST CODER TYPE TDA-10 **FIG. 1**

TELEGRAPH TEST CODER TYPE TDA-10

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TELEGRAPH TEST CODER TYPE TDA-10

1. GENERAL DESCRIPTION

The Coder Type TDA-10 has been specifically designed by A.T.E. engineers for use in the TDMS5 range of Telegraph Distortion Measuring Sets, at speeds up to and including 200 bauds. The coder is, however, suitable for use in other telegraph sending equipments.

The basis of the coder is an insulated disc covered with a suitable metal on which the intelligence is etched. The intelligence consists of three tracks performing switching functions and five coding tracks corresponding to the five elements of the Murray code.

The coding and switching contacts take the form of a moulded contact wiper assembly mounted on a bridge so that the wiper tips bear lightly on the tracks of the printed image, making contact with a metallic or insulated segment. The metallic segments of the coding tracks are connected together and earthed through a common contact wiper.

The coding earth return and the three switching contact wipers are grouped at one end of the bridge and are aligned to concentric tracks near the centre of the disc.

The five coding contact wipers are grouped at the opposite end and aligned to tracks near the circumference of the disc, the first coding element being the inner of the five tracks and the fifth element the outer track.

The coding disc is stepped from character to character by means of a drive coil, armature, pawl and 100-tooth index wheel, enabling the coding disc to carry a 100-character message.

The coder chassis is mounted to a modified Carpenter Type 3 relay base to prevent accidental insertion of a type 3 relay or vice-versa.

The chassis is protected by a cover to form a self contained plug-in unit which is a direct replacement for the etched disc type coder.

Since special coding discs are supplied to meet specific requirements, the coding disc fitted to a particular coder is identified by a suffix number after the coder type number on the cover label.

2. CODER CHARACTERISTIC

The Coder, Type TDA-10 will have numerous applications for the transmission of test messages in a variety of telegraph sending and test equipments.

The coder characteristics of the standard model are as follows:

Coil Resistance	-	2100Ω
Minimum Operating Current	-	25mA d.c.
Maximum Safe Continuous Voltage Applied Across Coil	-	160 volts.
Disc Insulation Resistance	-	Greater than 10 000MΩ at 500V.
Contact Resistance	-	2 to 30Ω
Coder Dimensions:		
Height	-	5.2 inches including handle. Length of locating pins 0.6-in.
Width	-	2.4 inches.
Depth	-	1.4 inches.
Type of Base	-	Modified Carpenter Type 3 relay.
Weight	-	1lb. 1oz.

3. CODER OPERATION

On application of a drive pulse from the telegraph equipment, the armature closes and a pawl rotates the index wheel for a distance of one tooth. When the pawl hits the back stop, movement ceases and the index wheel is rigidly held by the pawl.

At the end of the drive pulse, the drive current decays to the "fall-out" value and the armature is returned by tension of an armature return spring. The armature return movement is limited by an armature stop which is set to allow the pawl, on its return, to rest inside the next tooth on the index wheel.

The pawl is held in contact with the index wheel by a pawl return spring. A brake pad prevents reverse movement of the index wheel by the return of the pawl.

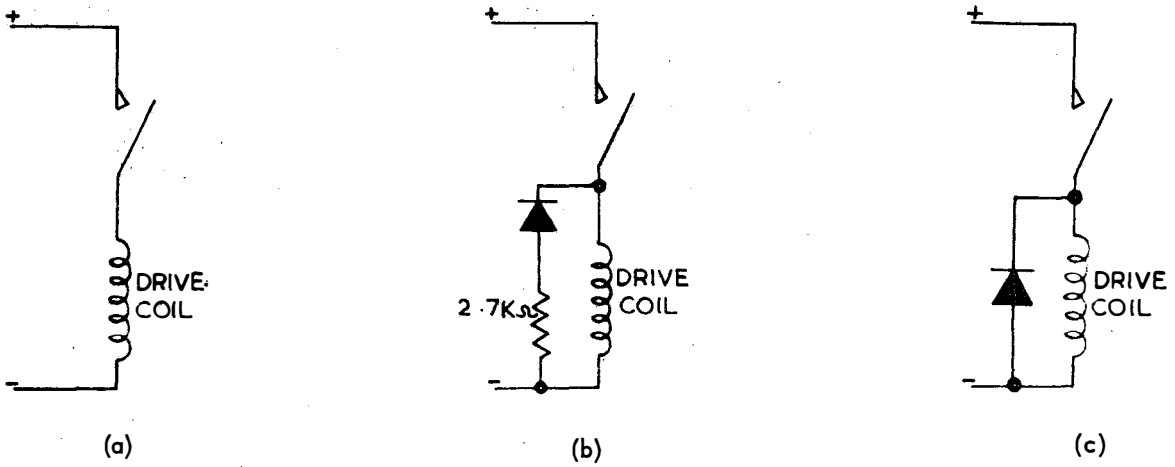
The cycle is repeated upon application of the next drive pulse and the index wheel is moved to the next position.

In the TDMS5 equipments, the coder operates up to a speed of 200 bauds. The maximum reliable speed at which the coder will operate in other equipments will depend largely upon the type of drive circuit used.

4. OTHER APPLICATIONS

For use in other types of telegraph sending equipment, the requirements will be that the coder be driven during the stop element which may be 1, 1½ or 2 units duration. The maximum operating speed will depend upon the type of drive circuit used and the applied voltage.

The Table below gives a few examples in this respect:



TABLE

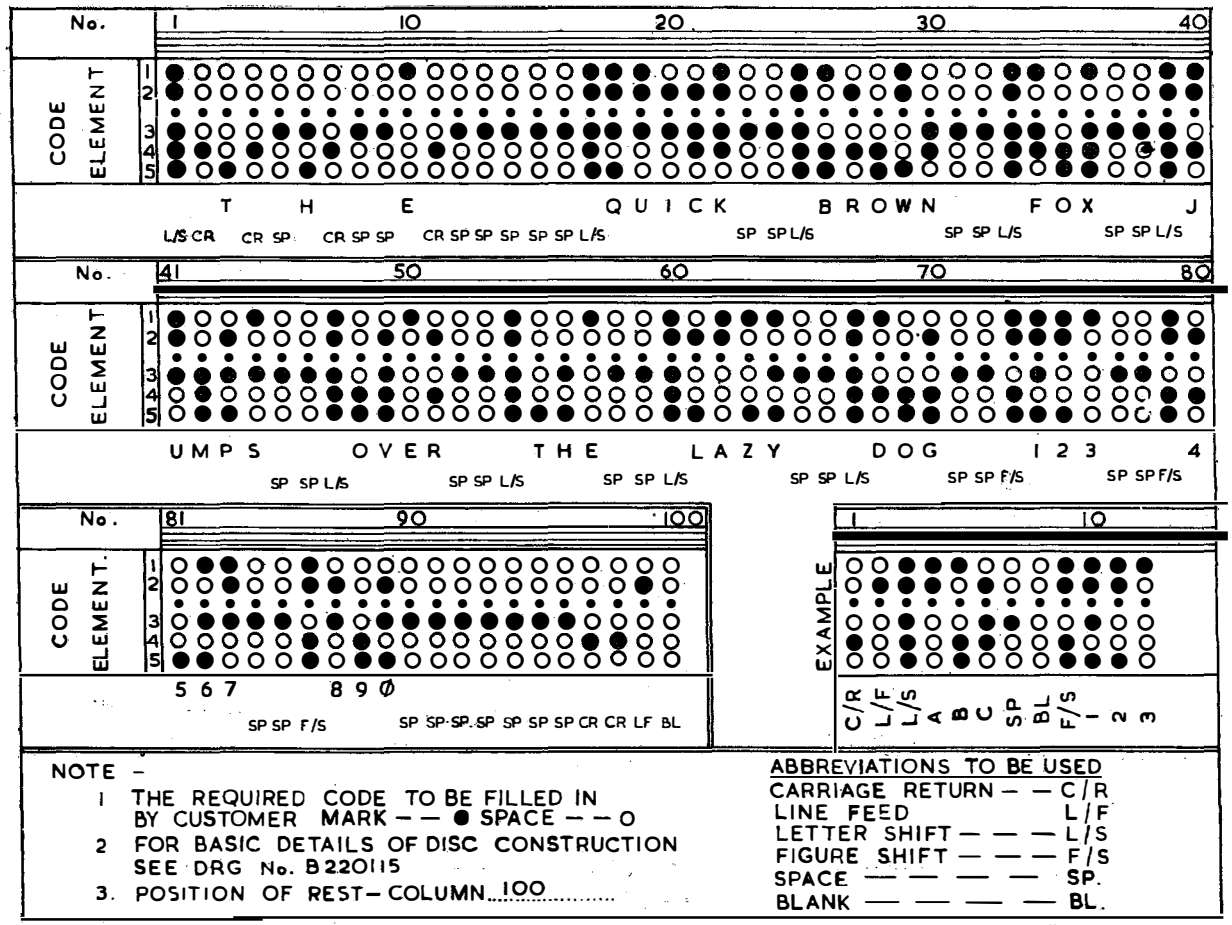
CIRCUIT ARRANGEMENT	DRIVEN FROM 80 VOLTS ON/OFF RATIO		DRIVEN FROM 110 VOLTS ON/OFF RATIO	
	1:1	1:6	1:1	1:6
(a)	80 Bauds	50 Bauds	100 Bauds	70 Bauds
(b)	60 Bauds	70 Bauds	60 Bauds	100 Bauds
(c)	25 Bauds	80 Bauds	30 Bauds	160 Bauds

The operate time is dependent upon the applied voltage. Example: 50 volts applied (undamped) - Operate time approximately 20mS.

As the applied voltage is increased, the operate time is reduced from this figure.

5. THE TEST MESSAGE

Figure 2 shows the standard British 100-Character test message.



Standard British 100-Character Test Message **Fig. 2.**

Any message may be produced on a coding disc of this type, but in normal practice the following essentials should be observed.

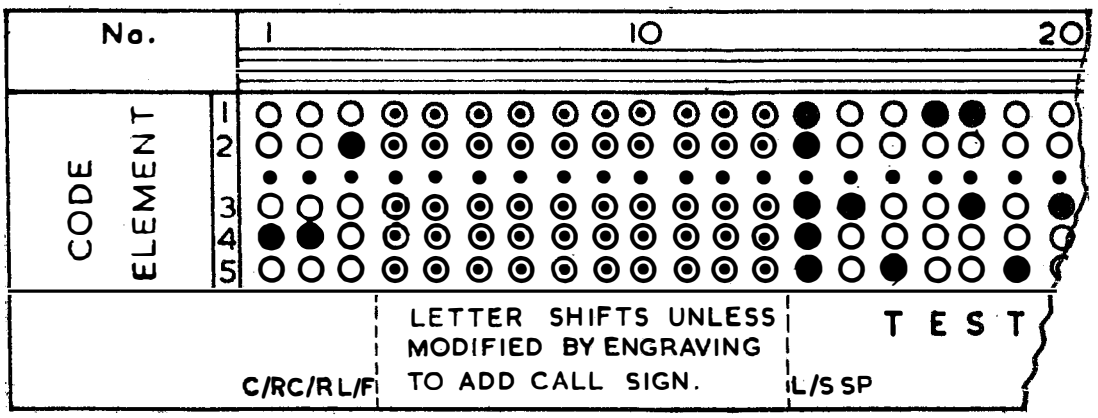
1. The message must contain 100 characters.

2. The character corresponding to the rest position of the coder, normally position 100 on the disc, is the first character to be transmitted. To ensure that the teleprinter is in a known state, the message should normally start as follows:

Position 100	-	Blank
Position 1	-	Letter Shift
Position 2	-	Carriage Return
Position 3	-	Line Feed

3. When the coder is used in conjunction with page teleprinters, the number of characters should not exceed the line length of the teleprinter (normally 69 to 72 characters) before a carriage return and line feed signal is included.

4. When a standard message is required with various call-signs, the disc can be arranged so that different call-signs may be produced from one common disc. In this case the call-sign section consists of a special block of up to ten letter shift signals, these letter shifts may be modified to any other character by an engraving process. Figure 3 is a section of a specimen proforma illustrating how this requirement should be shown.



Section of Proforma Showing Call-Sign Block **Fig. 3.**

6. CHANGING CODING DISC

Figure 4 shows the coder with the contact assembly and coding disc removed. The coder should first be removed from itscover, care being exercised to avoid damage to the contact assembly.

1. Remove the four screws securing the contact moulding assembly and lift the whole assembly clear of the disc.

2. Remove the disc clamping ring and remove the disc.

3. Fit the new disc and loosely clamp it with the clamping ring.

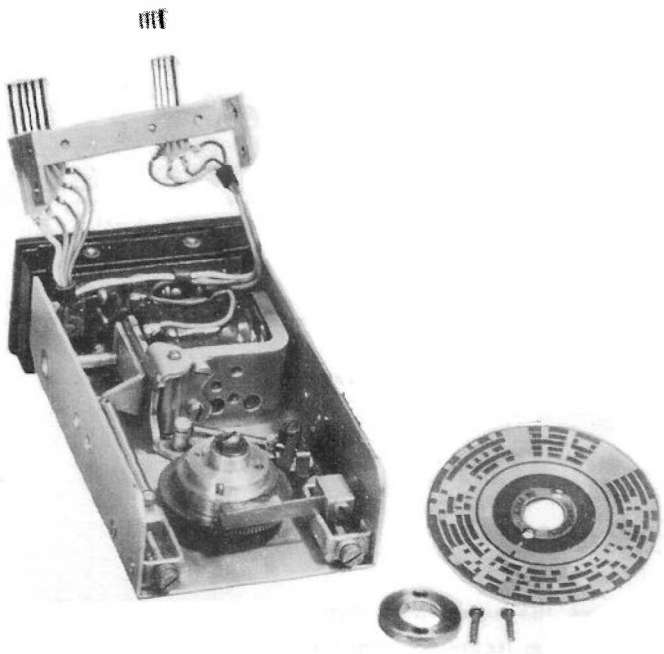
4. Replace the contact moulding assembly.

NOTE *The contact pressure on the coding disc is too light to measure by normal mechanical means without risk of damage. The wiper contacts should recline at an angle of 20° to 30° with respect to the moulding before the assembly is fitted.*

5. Rotate the index wheel to a known position on the contact track, move the disc until the contacts are in the centre of their correct sectors and then tighten the clamping ring.

6. Step the index wheel through all 100 positions checking that the contacts are in the centre of the sectors and tracks in each position.

7. Ensure that the coding disc is stepped round to the rest position (position 100) before replacing the coder in its cover, otherwise with some telegraph equipments with which the coder is used, the coder cannot start when functionally tested. With the 100-character test message disc, the rest position is when the switching contact is open-circuit. This can be seen on the inner track of the disc adjacent to one of the disc securing screws.



Contact Assembly and Coding Disc Removed **Fig. 4.**

7. MAINTENANCE

7.1. General

The adjustment of the coder mechanism is more important when the coder is operated at 200 bauds than at 50 bauds and as a result, the period of time before attention is necessary will depend largely upon the speed at which the coder is normally operated.

Providing the coder is functioning correctly, it is not necessary to inspect it until 20×10^6 operations (20 000 disc revolutions) have been performed irrespective of operating speed.

There is no need to dismantle the coder until the main spindle requires lubrication, or a part needs replacement.

If the coder has been standing unused for a prelonged period of time, erroneous printing may result when the coder is brought back into service. The self-cleaning action of the contact wipers will usually remedy this condition after a few revolutions of the coding disc.

Should this method fail, the coder should be removed from its cover and the coding disc contact tracks lightly wiped with a piece of lint-free cloth moistened with "Servisol" or similar switch cleaning fluid. To clean the entire disc surface it will be necessary to manually rotate the disc. The disc will rotate quite freely in the forward direction only. Care should be exercised to avoid damage to the contact wipers when cleaning the coding disc in this manner.

Before refitting the coder in its cover, ensure that the coding disc is rotated to the rest position.

7.2. Adjustments

Adjustments to the coder mechanism should be carried out in the following order:-

1. Manually operate the armature and check that the gap between the armature and pole face is .005-in. If this is incorrect, slacken the motor fixing screws and, with a .005-in. feeler gauge held between the armature and pole face by the manual operation of the armature, rotate the motor on the chassis until the index wheel is held rigidly by the pawl. With the motor in this position, tighten the motor fixing screws.

2. Adjust the armature stop so that when the armature is released, the pawl comes to rest 1.3 teeth from the fully operated position. This may be observed through the aperture in the back of the coder chassis.

3. Set the brake tension to be just sufficient to prevent any anti-clockwise movement of the index wheel when the armature is released. Further increase the pressure by one full turn in an anti-clockwise direction of the adjusting screw.

4. Connect the coder to the telegraph equipment by means of a Coder Adaptor B104/1256. With the motor driven at maximum operating speed, adjust the armature return spring tension from minimum until the disc rotates evenly. From this initial setting, further increase the spring tension by one full clockwise turn of the adjusting screw.

5. It may now be necessary to make further slight adjustments to the brake pressure and the armature return spring tension. When the coder is operating correctly the index wheel teeth should appear stationary.

7.3. Lubrication

If the following points are dry, they should be lubricated sparingly with a light machine oil:

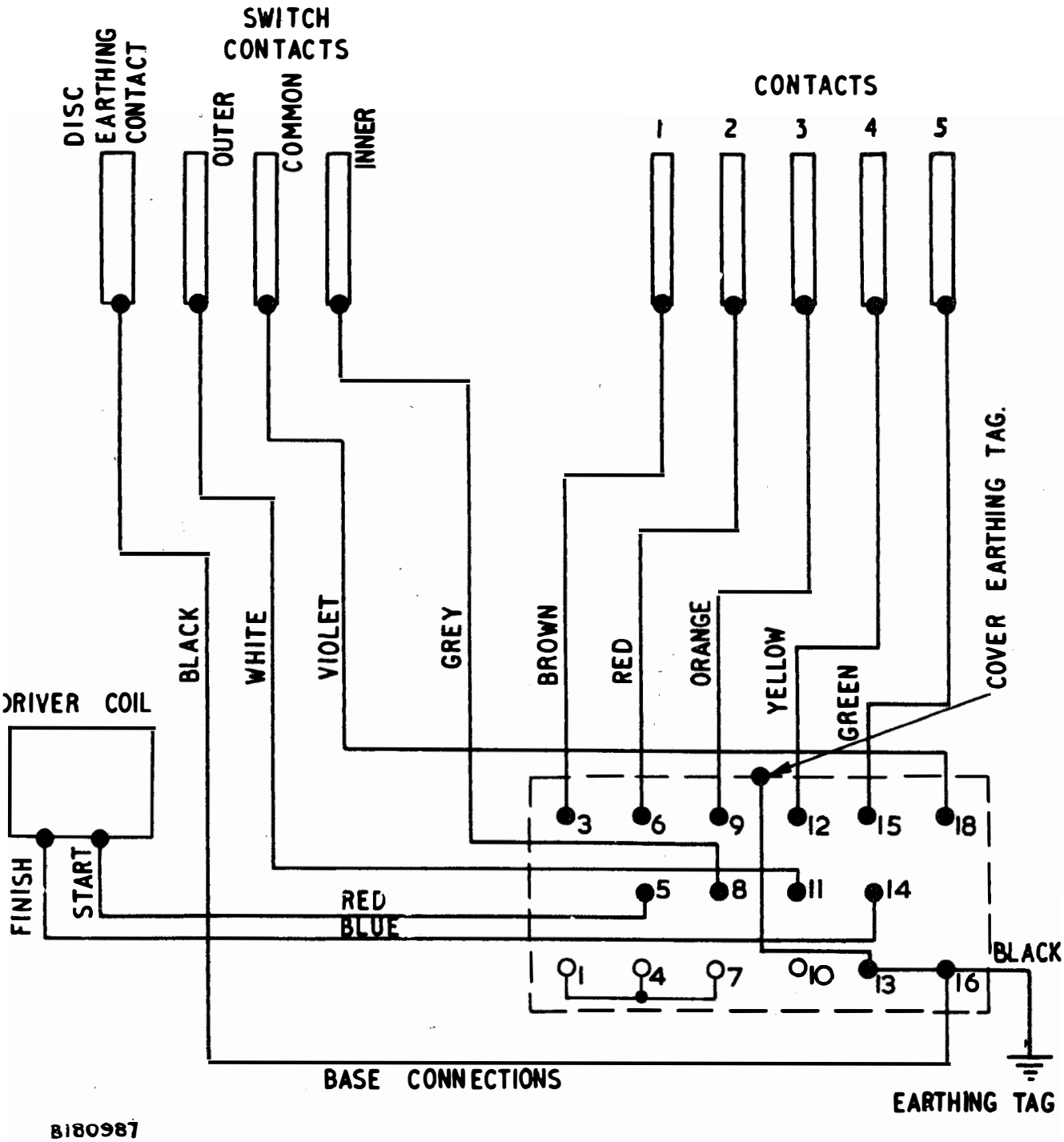
(a) Pawl Bearing
(b) Teeth of Index Wheel
(c) Felt Brake Pad
(d) Armature Bearing

When the main spindle requires re-greasing, the recommended grease should conform to Specification DTD783.

7.4. Coder Wiring

Continuity checks should be carried out according to the coder wiring diagram in Figure 5. When making these checks it will be necessary to step the coder on so that the contact of the circuit under test is on a metallic segment of the coding disc.

NOTE: *A 500 volt Megger should NOT be used for insulation tests on parts of the circuit connected with the coding disc as this can cause damage to the image on the disc, Insulation tests, if considered necessary, should be carried out using a high impedance device.*



TEST MESSAGE CODER TDA-10 - Wiring Diagram (Standard Model) **Fig. 5.**

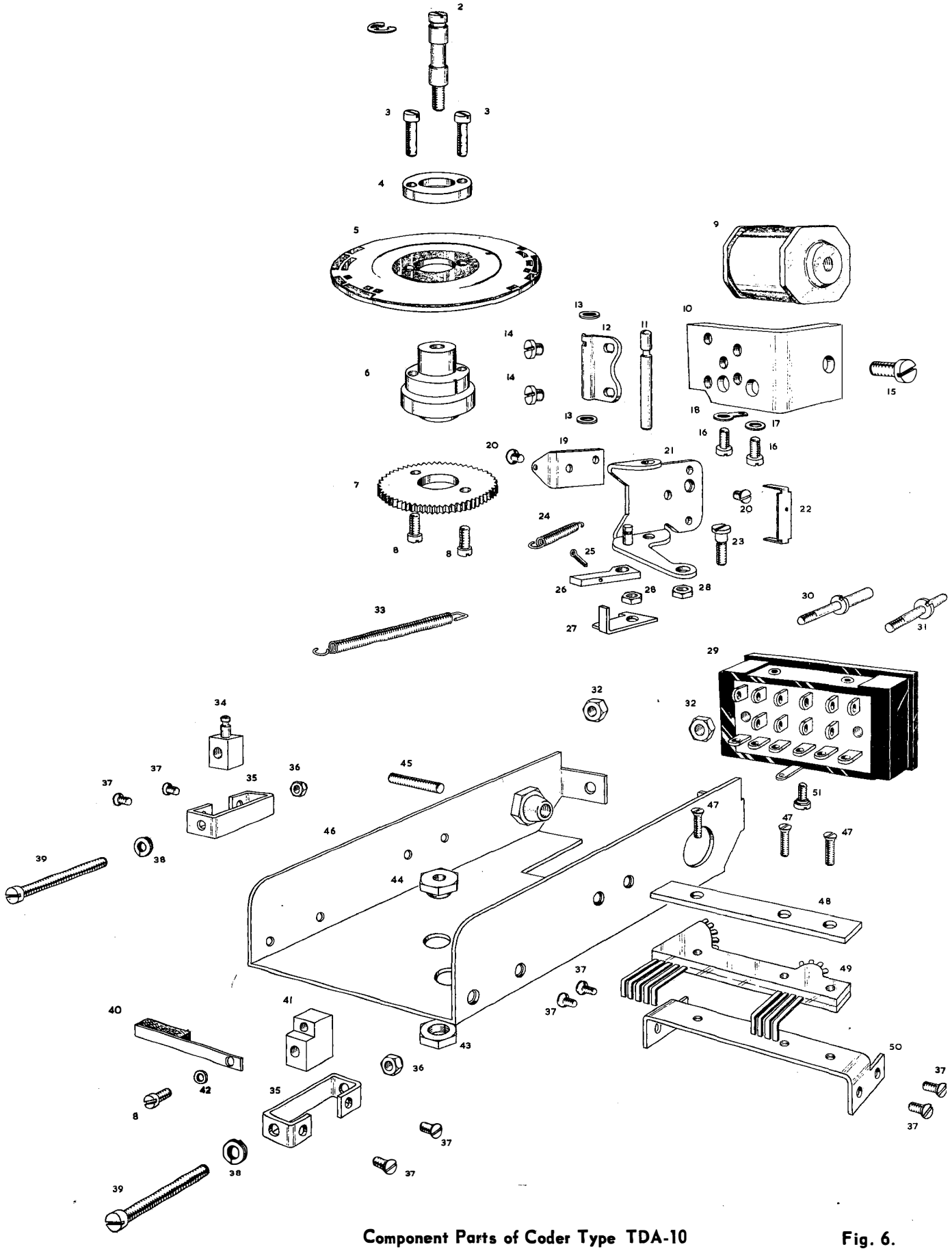
8. PARTS LIST

ITEM No.	DESCRIPTION	PART NUMBER
1	Circlip	B 170384
2	Spindle	B320193
3	Screw 8BA $\frac{3}{8}$" C HD. S.C.P.	
4	Clamping Ring	B410113
5	Coding Disc	B990210
6	Boss	B220113
7	Indexing Wheel	B220114
8	Screw 8BA. $\frac{1}{4}$" C HD	
9	Coil Assy	B 104/1282
10	Heelpiece	L 63098-A
11	Pin	L 37020-A
12	Bracket	B 140740
13	Shim (as required) 0.005" 0.010"	B361241-2
14	Screw 6BA $\frac{3}{16}$" C HD S.C.P.	
15	Screw 3BA $\frac{3}{8}$" C HD S.C.P.	
16	Screw 6BA $\frac{3}{8}$" C HD S.C.P.	
17	Washer 6BA	B361089
18	Solder Tag 6BA	B200063
19	Plate	B211412
20	Screw 6BA $\frac{1}{8}$" C SK. HD. S.C.P.	
21	Rivetted Assy of Armature	B 107/0893
22	Plate	L 787022-A
23	Pawl Bearing	L 76843-A
24	Pawl Return Spring	B570124
25	Split Pin $\frac{3}{64}$" Dia. $\frac{1}{2}$" Long	
26	Pawl Lever	B 230056
27	Overrun Stop Plate	B211343
28	Nut 6BA Lock S.C.P.	
29	Plug	B720472
30	Locating Pin (Large)	B320183
31	Locating Pin (Small)	B320184
32	Nut 4BA Full S.C.P.	
33	Armature Return Spring	B570125
34	Block	B770263
35	Bracket	B 140727
36	Nut 6BA Nyloc	B360898
37	Screw 8BA $\frac{1}{8}$" C SK. HD.	
38	Washer 6BA Double Coil	
39	Screw 6BA $1\frac{1}{8}$" CH HD.	
40	Brake Arm Assy	B 104/1614
41	Block	B770262
42	Washer 8BA	B361091

ITEM No.	DESCRIPTION	PART NUMBER
43	Locking Nut	B361184
44	Bush	B330324
45	Grub Screw	B361185
46	Chassis	B110225
47	Screw 8BA x ¼" C SK. HD S.C.P.	
48	Plate	B211411
49	Contact Moulding Assy	B104/1589
50	Bridge	B420038
51	Cover Retaining Screw	B361153
52	Cover Assy (not shown)	B104/1280

In addition to the above, the following is available at additional cost:

	Spare Kit for Coder Type TDA-10 (in moulded case) containing:-		B104/1211
23	Pawl Bearing	Quantity 1	L76843-A
24	Pawl Return Spring	Quantity 1	B570124
26	Pawl Lever	Quantity 1	L230056
33	Armature Return Spring	Quantity 1	B570125
40	Brake Arm Assembly	Quantity 1	B104/1614
49	Contact Moulding Assembly	Quantity 1	B104/1589



Component Parts of Coder Type TDA-10 **Fig. 6.**

IMPORTANT NOTICE

When ordering replacement parts from the factory, or raising any query about your equipment, the following information must be supplied to ensure that the correct items, or information, are sent to you.

1. Your original order number and date and, if possible, our factory order reference, advice or invoice number.

2. Type of equipment for which parts or spares are required.

3. Serial number of each unit for which parts or spares are required.

4. Modification number (if fitted) applicable to the particular unit.

NOTE: *Component values provided in the accompanying circuit details are those associated with the equipment for which this handbook is produced. Due to customers and systems requirements, small changes may be found if relating these details to other equipments not associated with this particular order.*

Progress in engineering and manufacturing methods may warrant changes in equipment, design, or components and the manufacturer reserves the right to make such changes without notice.

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