

B.T. LINE TESTER 422A/1

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SECTION 1

FUNCTION

Line Tester 422A is designed to test telephone lines by dividing the line and the line circuit, thus giving total control.

The Tester is designed to work to the Exchange Neg 50v DC supply, or Mains 240v AC supply via a plug fitted with a 3 amp fuse.

MF Tones are detected by the built in detector and indicate on an LED display.

Sockets are provided to connect external meters and megger to line with individual control.

Dial speed and ratio tests can be carried out.

SECTION 2

FACILITIES

- 1a Connection of a Service Telephone and/or a Hand Held Telephone (page 4)
- b Testing to Exchange Equipment and to Line Under Test. (page 6)
- c Loop Dialling. (page 5)
- d Speaking on Line Under Test. (page 5)
- e Monitoring on a Line Under Test. (page 5)
- 2 Testing with a Voltmeter. (page 5)
- 3 Measuring of Resistance. Line, Leak or Re call Earth. (page 7)
- 4 Dial Speed Ratio. (page 7)
- 5 MF Tone Detection. (page 8)
- 6 Applying inbuilt Graduated Howler to line. (page 8)
- 7 Applying inbuilt Ringer to line. (page 8)
- 8 Receive Incoming Calls. (page 8)
- 9 Hold Calls on the Tester or Service Line. (page 8)
- 10 Audible Testing to Line using Internal Buzzer. (page 8)
- 11 Testing with Meters Externally Connected via Plug and Socket (page 8)
- 12 Testing to Line with a Megger Externally Connected via Plug and Socket. (page 9)
- 13 Connection to Exchange Neg 50v Supply or Mains 240v Supply (page 4)
- 14 Internal 40v stabilised supply.
- 15 Portable - A carrying handle provided as standard, but 910C comes with a leather carrying case as an extra.
- 16 Tester can be tilted backward for improved viewing by use of retractable tilt foot.
- 17 Overall dimensions:
 - Height including Feet & Handle - 220mm
 - Width - 432mm
 - Depth - 224mm

SECTION 3

SETTING-UP PROCEDURE

1 Connect all services to the Tester on the front mounted jacks and set up as follows:-

2 (a) 50v DC

Connect 50v supply by using the lead provided with the Jack Plug (type 316). Connect the plug into the socket on the rear of the Tester marked 50v DC and the plug 316 into a local 50v supply. Ensure the switch on the rear of the tester is switched to 50v DC.

(b) 240v AC

Connect 240v AC by inserting the plug into the socket on the rear of the tester and the mains plug into a convenient 40v AC mains outlet. Ensure the main plug is fitted with a 3 amp fuse set switch on the rear of the Tester to 240v AC.

NOTE UNDER NO CIRCUMSTANCES MUST 240V AC BE CONNECTED TO THE 50V DC SOCKET

3 Connect the line under test to the 'Test Line' and 'Test Exchange' Jacks 'A' leg to tip, 'B' leg to ring.

4 Connect the service line to the 'Service Line Jack A' leg to tip, 'B' leg to ring.

SECTION 4

IMPORTANT

After connection to the supply allow 5 minutes for the 40v supply to stabilise. Then check 40v supply by operation of TEST LINE & ZERO CHECK KEYS. If not 40v±1 or -1, then return to BCH Communications Limited as the accuracy of the Tester cannot be guaranteed.

DESCRIPTION

1A SERVICE TELEPHONE

The Service Telephone is always through to its own line circuit with all keys normal. If the Service Telephone is in use i.e. the SPEAK KEY operated, then any incoming calls will cause a buzzer to sound until the SPEAK KEY is restored to normal. The Service Telephone bell will now ring and the call can be answered.

B The SERVICE TELEPHONE can be used to answer a call on the TEST LINE. With the TEST EXCHANGE and SPEAK KEYS operated a call on the line under test will ring the service telephone.

C TESTING INTO EXCHANGE EQUIPMENT AND OUT TO LINE UNDER TEST.

To gain access to the Exchange Equipment operate the TEST EXCHANGE KEY.

To gain access to the Line under test operate the TEST LINE KEY. With both these keys normal, the line under test is through to the exchange, via the Tester.

D LOOP DIALLING

To dial out using the service telephone, and the line circuit associated with the line being tested, operate the TEST EXCHANGE & SPEAK KEYS.

Loop dialling over a junction can be achieved by operating the TEST LINE & SPEAK KEYS.

E TO SPEAK on the line under test using the service telephone, operate the SPEAK BATTERY & SPEAK KEYS.

F TO MONITOR a line with the service telephone operate the SPEAK KEY, to monitor with the integral speaker operate the MONITOR KEY.

2 TESTING WITH THE VOLTMETER

The moving coil voltmeter has a normal scale of 0-50volts. To read 0-5 volts operate the 0-5 VOLT & RECEIVE NEGATIVE KEYS. To read 0-100 volts operate VOLTS x 2 KEY. For positive battery tests operate the VOLTMETER REVERSE KEY.

SECTION 4 CONTINUED

TESTS TO EXCHANGE

B WIRE TESTS

To test the B wire from the exchange, operate the TEST EXCHANGE & VOLTMETER KEYS. If OK there is no reading. If a RESISTANCE EARTH is present there will be a low reading. Then operate RECEIVE NEGATIVE KEY and the meter should read Exchange Voltage or 50v if Tester is mains supplied, If no reading, the B leg is OPEN CIRCUIT.

A WIRE TESTS

To test A wire from the exchange operate the TEST EXCHANGE, VOLTMETER & LINE REVERSE KEYS. If OK the meter reads Exchange Voltage or 50v if Tester is mains supplied. If no reading the A wire is OPER CIRCUIT. If low reading, operate the RECEIVE NEGATIVE KEY. The reading obtained indicates a high or low resistance.

TEST TO LINE

B WIRE TESTS TO LINE

Handset on, operate TEST LINE, VOLTMETER & RESISTANCE x 10 KEYS. If a FULL EARTH on the B leg the meter will indicate ZERO OHMS. If a 1K EARTH is on the B leg the meter will indicate 1K OHMS and so on.

TESTS FOR NEGATIVE VOLTAGE ON B LEG

Operate TEST LINE, VOLTMETER & RECEIVE NEGATIVE KEYS. If a NEGATIVE VOLTAGE is present on the B leg the meter will read actual voltage.

A WIRE TESTS TO LINE

As for B leg but with LINE REVERSE KEY operated.

NOTE

UNDER NO CIRCUMSTANCES must the EARTH KEY be operated during the above tests.

A WIRE TO B WIRE TESTS

Operate TEST LINE, VOLTMETER & EARTH KEYS. If the line is OK there will be no meter reading. If a LEAK exists there will be a VOLTAGE READING. The lower value of LEAK is indicated by higher VOLTAGE READING. Typical 20k leak shows 34 volts, 200k leak shows 14 volts.

3 MEASUREMENT OF RESISTANCE - OPERATE TEST LINE KEY

Hold the ZERO CHECK KEY operated, operate RES x 100 KEY and adjust ZERO OHMS. Release ZERO CHECK KEY. The meter now reads in the 0 to 500k range. To read in the lower scale of 0 to 50k operate RESISTANCE x 10 KEY, hold ZERO CHECK KEY operated and adjust ZERO OHMS until the meter reads zero. Release ZERO CHECK KEY.

TO FIND ACTUAL LEAK RESISTANCE

Operate TEST LINE, VOLTMETER, EARTH & RESISTANCE x 100 KEYS.
The meter reading indicates the LINE LEAK in ohms.

TO FIND ACTUAL LINE RESISTANCE

Remove handset. Operate TEST LINE, VOLTMETER, EARTH & RESISTANCE x 100 KEYS. A line of ZERO OHMS will show the telephone resistance.

RE CALL EARTH TESTS

To test the RE CALL RESISTANCE EARTH on the A leg, operate TEST LINE, VOLTMETER, & LINE REVERSE KEYS & appropriate RESISTANCE KEY.
With the handset on, press the RE CALL BUTTON. The resistance reading should be half the line resistance.

4 DIAL SPEED/RATIO TESTING

For DIAL SPEED/RATIO TEST the circuit needs to be connected to LINE UNDER TEST and the phone 'OFF HOOK'.
Operate TEST LINE, SPEAK BATT & SPEED KEYS. Operate and release the PRESET KEY, METER presets to approximately 10 IPS. Dial '0' meter, indicates speed of the dial.
Release SPEED KEY. Operate RATIO KEY then operate and release PRESET KEY. Meter presets to approximately 33 1/3% ratio.
Dial '0' meter indicates ratio of the dial. At end of pulse train meter reads approximately F.S.D. release RATIO KEY.

5 DIAL PULSE COUNT TEST

Operate TEST LINE, SPEAK BATT & MF TONES PULSE COUNT KEYS.
Remove the handset from the telephone number test, dial the required digit, the digits received will be displayed on the LED display.
Decadic push button phones can also be tested with tests 4 and 5.

6 DTMF TEST

Operate TEST LINE, SPEAK BATT & MF TONES PULSE COUNT KEYS.
Remove the handset from the telephone under test and press the required digit. If the received tones are above the limit of -27 db then the appropriate LED will light.

7 APPLYING INTERNAL HOWLER TO LINE

Operate the TEST LINE KEY, operate and HOLD the HOWLER KEY for as long as is required to apply the HOWLER TONE to the telephone under test. The HOWLER is a single HIGH TONE, with GRADUATION.

8 APPLYING RINGING TO LINE

To apply ringing current to line, operate the TEST LINE KEY, operate and hold the RING KEY for length of time required.

9 INCOMING CALLS

Normally all incoming calls will ring the SERVICE PHONE if however, the tester is in sue and the SPEAK KEY is operated the buzzer will sound to give indication of the incoming call.

SECTION 4 CONTINUED

10 HOLDING CALLS

If it is required to hold a call on the SERVICE LINE whilst testing takes place, operate HOLD SERVICE LINE KEY. However, if the line under test has to be held whilst using the service line, then operate the HOLD TEST LINE KEY and release the SPEAK BATTERY KEY for privacy.

11 AUDIBLE LINE TESTING USING TEST BUZZER

To check LOOP, BATTERY B leg or EARTH A leg operate TEST LINE, TEST BUZZER, LINE REV & SPEAK BATT KEYS. To check BATTERY A leg or EARTH B leg operate TEST LINE & TEST BUZZER KEYS. When faults are present the buzzer will sound until either the TEST BUZZER KEY is restored or the fault cleared.

12 EXTERNAL METER

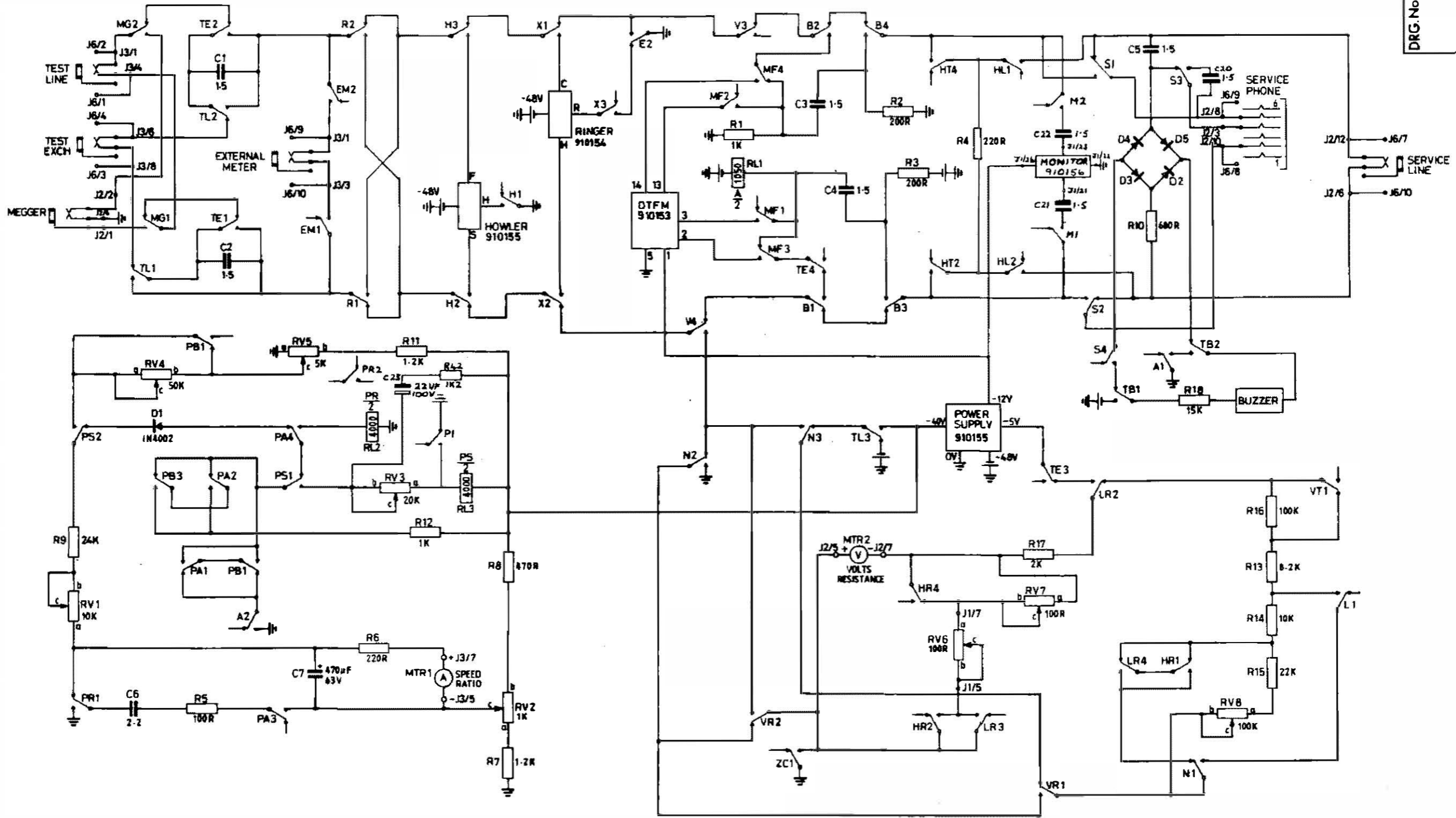
An external meter can be connected via the socket fitted to the front of the tester.
To test the line operate TEST LINE & EXTERNAL METER KEYS.

13 MEGGER

An external MEGGER can be connected via the socket fitted to the front of the tester. To test the line operate MEGGER KEY.

14 MONITOR

To monitor the line under test for tones or speech operate the MONITOR KEY, any tones or speech will be heard on the integral speaker.



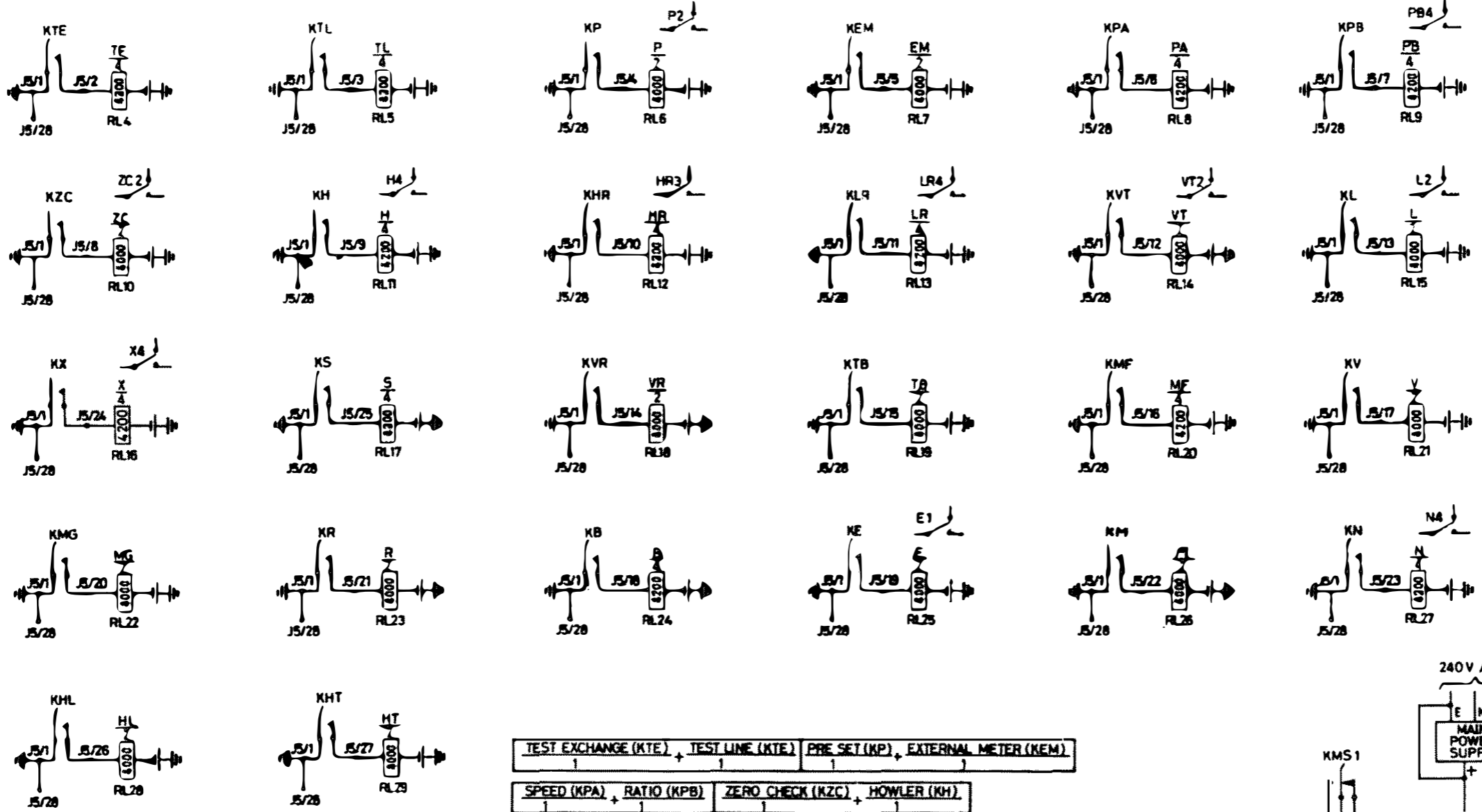
ISSUE	DESCRIPTION	APPD.	DATE
2	PI SPRINGSET RE-POSITIONED CND123	AKB	10/11/51
3	R10 WAS SHOWN W/WRNG TO S2 LEVER CIRCUIT C21, C2, C3, R4, R2, M1, M2 AND MONITOR CIRCUIT	AKB	11/10/51
4	ADDED DA LAMP & RELAY CND211	AKB	1/10/52

TITLE
LINE TESTER CIRCUIT DIAGRAM

DRAWN PS TRACED CHECKED AKB APPROVED AKB DATE 12-9-51

DRAWING No.
910182

SHT. 1 OF 2



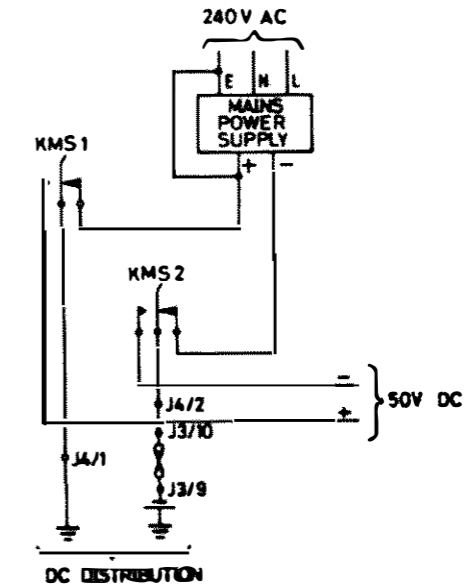
TEST EXCHANGE (KTE) + TEST LINE (KTE) PRE SET (KP) + EXTERNAL METER (KEM)

SPEED (KPA) + RATIO (KPB) ZERO CHECK (KZC) + HOWLER (KH)

RESISTANCE X 100 (KHR) + RESISTANCE X 10 (KLR) VOLTS X 2 (KVT) + 0.5 VOLTS (KL)

RING (KX) + SPEAK (KS) VOLT METER REVERSE (KVR) + TEST BUZZER (KTB) MF TONES (KMF) + VOLT METER (KV) MEGGER (KMG) + LINE REVERSE (KR) SPEAK BATT (KB) + EARTH (KE)

MONITOR (KM) + RECEIVE NEGATIVE (KN) HOLD SERVICE LINE (KHL) + HOLD TEST LINE (KHT) VOLTAGE SELECTOR (KMS)



NO.	DESCRIPTION	APPD.	DATE
2	CHANGE TO SHEET 1 - CH 0129	<i>[Signature]</i>	10/1/54
3	CHANGE TO SHEET 1 - CH 0136 FOR KEY, BUZZER AND DISCONNECT SWITCHES	<i>[Signature]</i>	10/1/54
4	FOR KEY, BUZZER AND DISCONNECT SWITCHES - CH 0211	<i>[Signature]</i>	10/1/54

TITLE
LINE TESTER CIRCUIT DIAGRAM

DRAWN FS	TRACED	CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DATE 13-9-59
DRAWING No. 910182				
SHT. 2 OF 2				