PIC1650-536

T-75-07-07

PLESSEY
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ADVANCE INFORMATION

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TELEVIEW AUTODIALLER/TERMINAL IDENTIFIER

The Autodialler/Terminal Identifier is an extension to the TELEVIEW system that is designed to perform the Autodialling function of a Viewdata system, to transmit the terminal identification (ID) code and to allow the remote programming of all the stored numbers.

The system consists of a PIC1650-536 attached to the TELEVIEW address and data highways, an EAROM for non-volatile storage of the ID and telephone numbers and relays for controlling the telephone line.

FEATURES

- Non-volatile Storage of 4 Telephone Numbers of 16 Digits
- 10 IPS Loop Disconnect Dialling
- Non-Volatile Storage of Identity Code of 16 Digits
- Full Remote Programming Capability
- Optional Local Programming
- Easy Connection to Teleview System
- Spare memory locations

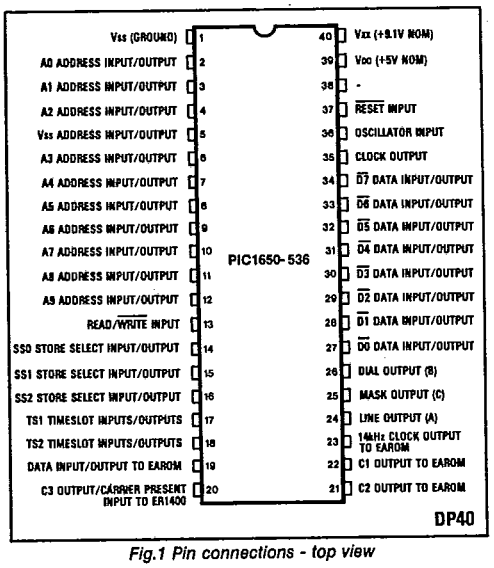

Fig.1 Pin connections - top view

PACKAGE

PIC1650-536 — 40 lead DIL

ABSOLUTE MAXIMUM RATINGS

See PIC1650 datasheet for details.

ELECTRICAL CHARACTERISTICS

See PIC1650 datasheet for details.

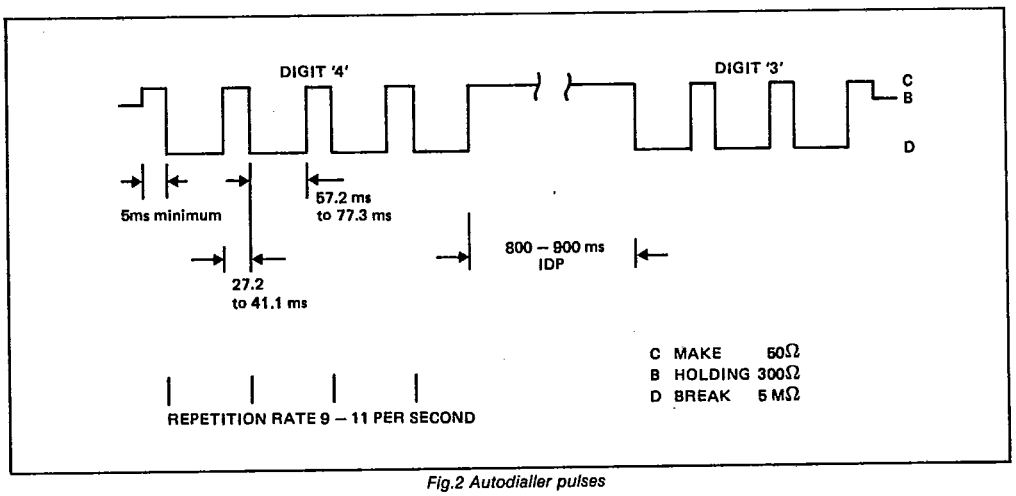

Fig.2 Autodialler pulses

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PIN FUNCTIONS

Pin No.	Name (Symbol)	Function
PIC1650-536		
1	Vss	Ground
2	A0	Address Input/Output - connect to TELEVIEW Address Bus
3	A1	
4	A2	
5	Vss	
6	A3	Address Input/Output - connect to TELEVIEW Address Bus
7	A4	
8	A5	
9	A6	
10	A7	
11	A8	
12	A9	
13	Read/Write Input/Output	Control to Page Memory - connect to TELEVIEW R/W line
14	SS0	Store Select Inputs/Outputs - connect to TELEVIEW SS lines
15	SS1	
16	SS2	
17	TS1	Time Slot Inputs - connect to TELEVIEW TS lines
18	TS2	
19	Data Input/Output	Interface to EAROM non volatile memory. Pin 20 doubles as the carrier present input.
20	C3 Output	
21	C2 Output	
22	C1 Output	
23	14kHz Clock Output	
24	Line Output (A)	Output to Line Looping relay
25	Mask Output (C)	Output to Mask relay
26	Dial Output (B)	Output to Dialling relay
27	$\overline{D0}$	Data Input/Output - connect to TELEVIEW Data Bus
28	$\overline{D1}$	
29	$\overline{D2}$	
30	$\overline{D3}$	
31	$\overline{D4}$	
32	$\overline{D5}$	
33	$\overline{D6}$	
34	D7	
35	Clock Output	Monitor point for Clock oscillator. Set frequency to 250kHz nominal
36	Oscillator Input	Connect Clock oscillator components to this point
37	$\overline{\text{Reset}}$ Input	Master reset input connect to corresponding pin on TELEVIEW control PIC1650
38	-	No connection
39	V_{DD}	Positive supply +5V nom.
40	V_{XX}	Positive supply to output buffers +9.1V nom.

OPERATION

Autodialler

The system responds to inputs via the TELEVIEW keyboard in order to initiate the automatic dialling of the Viewdata telephone numbers. There are 4 stored telephone numbers that may be accessed by 4 keys as described in the Prestel Terminal Specification.

Each Telephone number can consist of up to 16 digits including access pauses and formatting codes.

The system may be operated fully automatically or with manual dialling.

1. Automatic Dialling

With the system off-line and in the Viewdata mode the initial action is to press the Square (#) key. The Televiev system will be put in the Text mode and the currently displayed Store will be cleared. The telephone line will be looped and the audio should be switched to a loudspeaker.

Once dialling tone is heard a digit is pressed according to the Viewdata service required.

Digit 1 – will give the Prestel service. (Block 2)

Digit 2 – will give a second number for the Prestel service. (Block 3)

Digit 3 – will give the third number. (Block 6)

Digit 4 – will give the fourth number. (Block 7)

If a digit is not pressed for 30 seconds after the Square (#) key the line will be released. The digits will be put onto the screen as they are being dialled and if formatting characters had been loaded in the digit store the display will be spaced accordingly.

If a pause had been programmed, for access to a further dial tone for example, the system will put a * on the screen and wait for release. To release the access pause the appropriate digit is pressed again and dialling will continue. If the system does not receive a manual release it will continue after a time-out of four seconds.

If at the end of dialling the call fails, pressing the Square (#) key will clear the call and then start again by re-looping the line.

When the required incoming carrier tone is received the modem will return its appropriate tone to the Viewdata computer which may then send the first page of data and initiate terminal identification.

If the carrier tone is not received for any reason the line will be released after 30 seconds.

Once a satisfactory connection is made to the Viewdata computer (i.e. carrier is detected), the keypad will revert to normal Viewdata mode and dialling will not be possible.

2. Manual Dialling

If the required telephone number is not stored within the terminal the call may be made using the normal telephone. The system should start off-line and in the Viewdata mode. The number is dialled using the telephone in the normal way and when dialling is complete the Square (#) Key is pressed. This will put the system into the Text mode, erase the currently displayed store and hold the line. The telephone handset is replaced and once the carrier tone is received the procedure is as before.

3. Connection Release

If at any time the carrier detection logic detects that the carrier is lost the connection will be immediately released.

The connection will also be released when the Televiev system is switched to the Picture or Teletext modes, or if the Hold Key is pressed (if available).

Alternatively the appropriate computer log off procedure may be used.

In all cases the content of the Televiev Stores will remain as they were at the moment of disconnection.

5. Remote Programming

The Televiev highways will be monitored for those special ESC sequence codes that indicate the entry into the Programme-Verify mode as described in the Prestel Terminal Specification.

In the Televiev System the Data Acquistion chip receives data from the Viewdata computer and normally loads data to the display store. Any codes, particularly ESC sequences, that it does not use, it puts out onto the Televiev highway system where the remote programming device may receive them.

The basic programming sequences are as described in the Prestel Specification except that the data for programming the EAROM will initially be put into the display store by the DA chip. The programming device will read the digits from this store and erase them after checking that they are all valid codes. The display will be blanked during programming.

6. Local Programming

For system security, particularly in the domestic environment, the local programming of telephone numbers and identity codes is not encouraged.

However, the Televiev system has been designed such that it may "talk to itself" and by doing this and having some additional keys (especially ESC, ENQ, ?, : and ;) a very secure local programming mode is available.

The UAR/T transmit and receive clocks are connected to a single frequency, the output joined to the input and the carrier present input is forced true. The standard programming sequences may then be input to the system to read out and/or modify the content of the digit store.

7. Spare Storage

While only the first 7 blocks of storage are defined (as ID code plus 6 telephone numbers) a further 4 blocks are available and may be accessed by the Programme/Verify sequences if required. They could, for example, be used to store alternative identity/security codes for private Viewdata systems.

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8. Programming Routine

(The following is an extract from the Prestel Terminal Specification).

The programming Routine is entered by a 4 character sequence ESC1 ESC2. This puts the terminal into Programme-Verify mode (See Fig. 3). The memory is divided into seven 16 character blocks. A skip block command ESC 3 is used to skip through the blocks. Default is block 1 at entry to Programme-Verify mode. After a number (0–6) of skip block commands, Verify mode may be selected by ENQ, or Programme mode may be selected by ESC 4.

Entry of Verify mode shall cause the terminal to transmit down the telephone line the contents of the current block (excluding any space-filling characters) and 75 bit/s and then revert to normal mode.

Programme data shall follow ESC 4 using the numbers 0–9 for the Identity Code and the codes given below for telephone numbers. Character 3/15 (?) will be used as a space filling character after valid data characters to make the total number of characters in a block equal to 16. 3/15 (?) may also be used between parts of the number to identify "natural" breaks. It may then be displayed as a space if the number is displayed for the user, e.g. :17618?111??????? displayed as 01 618 1111. After recieving these 16 characters the terminal reverts to normal mode.

Dialler Codes DIALLED DIGIT	(only for blocks 2–7) RECEIVED IS07 CHARACTER (also used for transmission after ENQ for block verification)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	:
PAUSE	;
RESERVED	>
SPACE FILLER	?

A delay of at least 5s will be present between the last character to be written into the memory and the next attempt to leave Normal mode. This is to facilitate the use of slow write/erase memories.

Blocks 1–7 are defined as follows:–

Block 1	Identity Number
Block 2	Telephone Number A
Block 3	Telephone Number B
Block 4	Not used
Block 5	Not used
Block 6	Telephone Number E
Block 7	Telephone Number F

A and B are the Prestel Computer Centre telephone numbers.

E and F are the third and fourth choices.

9. Line Interface

(The following is an extract from the Prestel Terminal Specification).

Physical Termination

British Telecom will install a Jack 96A in customers premises to access Prestel. The customer Prestel Terminal will require a suitable compatible plug (e.g. British Telecom Plug 505).

DC CONDITIONS

Four sets of DC conditions are specified for the line interface.

(a) The off-line condition (idle state) applies when the terminal is not using the telephone line.

(b) The line holding condition applies when the terminal goes on-line, is sending tones to or receiving tones from the line and during inter-digit pauses.

(c) The pulsing make condition applies during the make part of a dialled digit pulse.

(d) The pulsing break condition applies during the break-part of a dialled digit pulse.

		Plug Points	Resistance	Capacitance
(a)	Off-Line Idle Condition	2–3	>5 Mohm*	$\leqslant 0.01\mu F$
		1–5	<10 ohm	
(b)	Line Holding Condition	2–3	$\leqslant 300$ ohm+	
		1–5	>5 Mohm	
(c)	Pulsing Make	2–3	$\leqslant 50$ ohm	
		1–5	>5 Mohm	
(d)	Pulsing Break	2–3	>5 Mohm	
		1–5	>5 Mohm*	
	All times	Any to earth	>5 Mohm*	$\leqslant 0.01\mu F$

* Measured at 250V DC. All conditions to be independent of polarity.

\+ Measured with line currents up to 120 mA.

The max DC short circuit available from line is 120mA.

AC CONDITIONS

When the terminal is on-line (i.e. line holding condition) it shall present an impedance between 400 and 900 ohms at an angle not greater than 45 degrees for all frequencies between 300Hz and 3400Hz between plug points 2 and 3.

AUTODIALLING

If a loop disconnect autodialler is fitted then the following requirements must be met:

The digit signals shall appear as loop disconnect pulses between Plug Points 2 and 3 at a repetition rate of between 9 and 11 pulses per second. The break period shall be

between 63% and 70% of the total pulse period (break plus make). The length of the break period condition (d) of each pulse shall be within the limits of 57.2 to 77.3 ms and the length of the make period condition (c) between any two break periods shall be within the limits 27.2 to 41.1 ms. For a period of at least 5 ms before and after pulsing condition (c) shall apply.

The digit to be dialled represents the number of break pulses to be sent except that digit 0 represents 10 pulses.

Inter digit pauses shall be provided. The duration shall be between 800 and 900 ms. During the pause, condition (b) shall apply except during the first and last 5 ms periods when condition (c) shall apply. Fig. 2 explains this diagramatically.

When the terminal is transferring to the line holding state the high impedance between Plug Points 1 and 5 must not be presented more than 20 ms before the low impedance is presented between Plug Points 2 and 3.

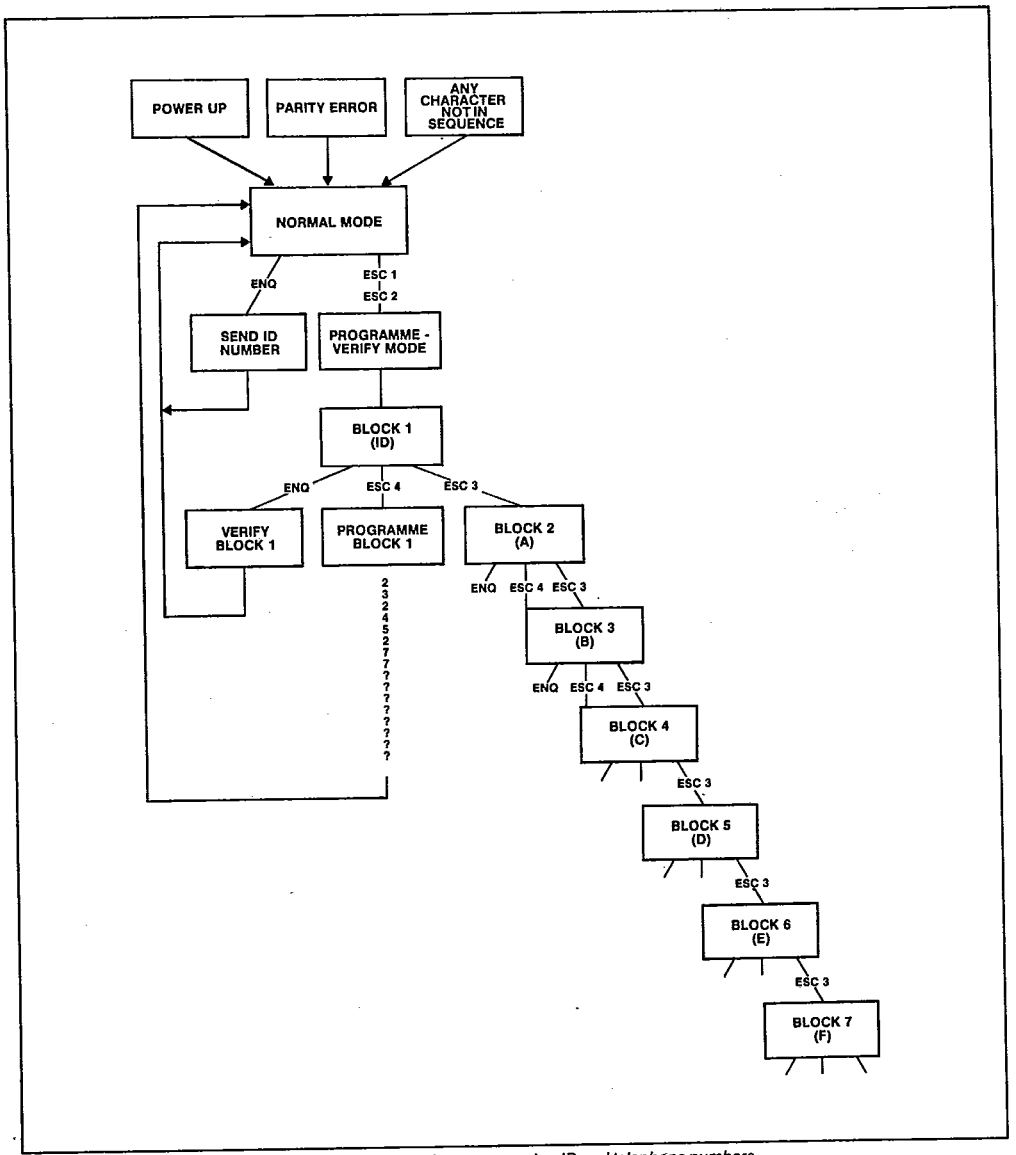

Fig.3 Flow diagram for programming ID and telephone numbers

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APPLICATION

The Autodialler/Terminal Identifier has been designed for easy incorporation into the basic Teleview system. Special care has been taken to ensure that pin connections allow an easy and logical printed circuit layout.

The circuit diagram of the main electronics is shown in Fig. 4 and that of the Line Interface in Fig. 5.

The system has the following power supply requirements:

+ 9.1V	@	13mA	
+ 5V	@	140mA	(Relays)
+ 5V	@	55mA	(Logic)
−26V	@	8mA	

It may be acceptable to eliminate RLC and substitute two silicon diodes back to back across the modem side of the isolation transformer. This will be subject to approval by the British Telecom if used in Prestel equipment.

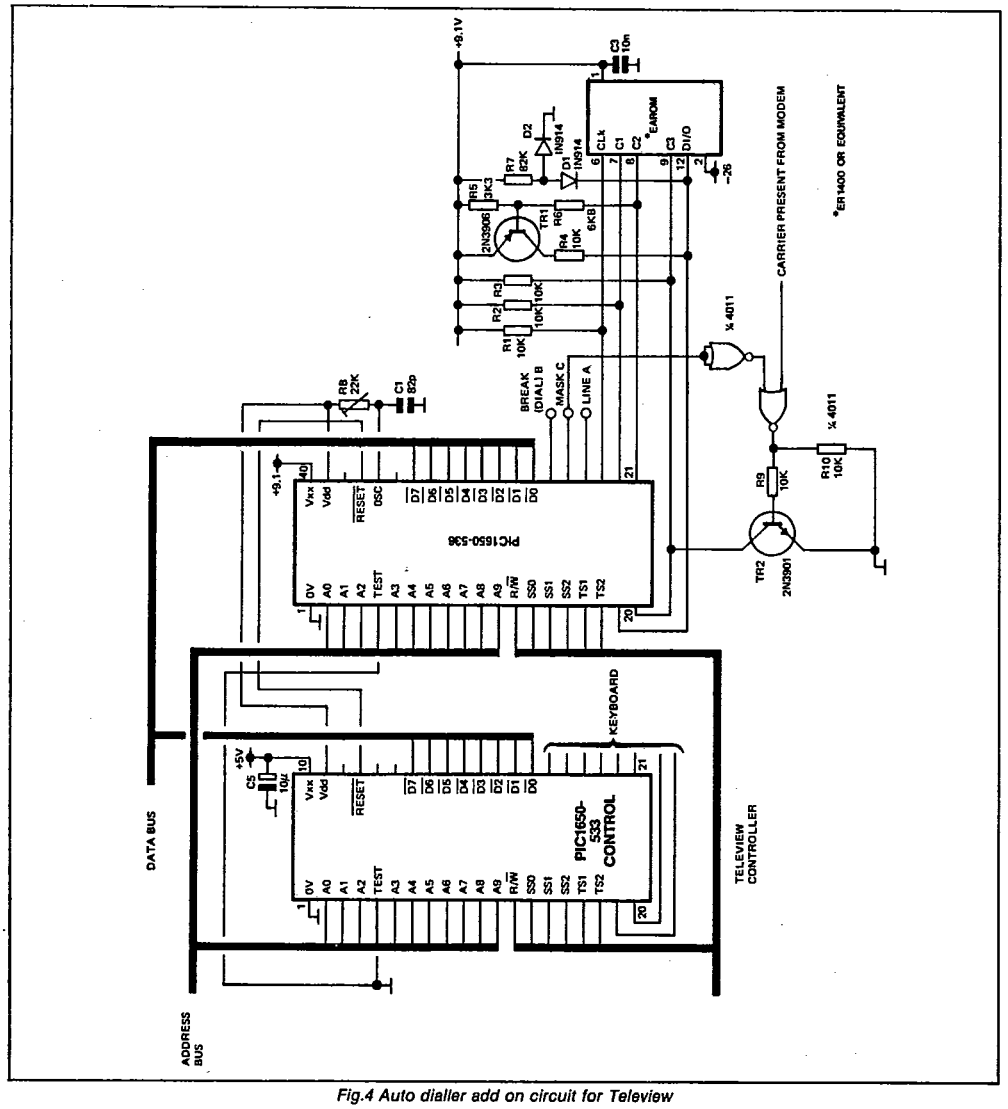

Fig.4 Auto dialler add on circuit for Teleview

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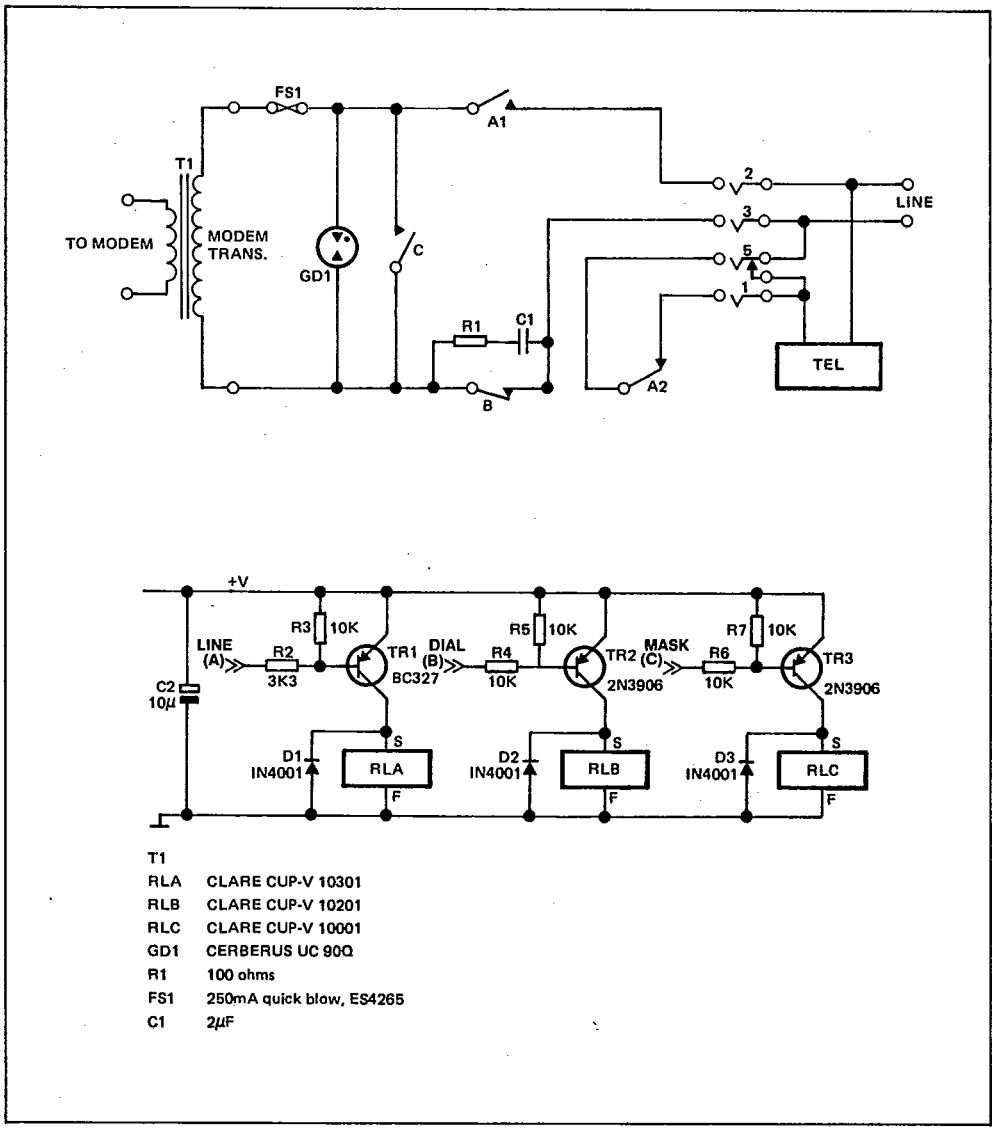

T1	
RLA	CLARE CUP-V 10301
RLB	CLARE CUP-V 10201
RLC	CLARE CUP-V 10001
GD1	CERBERUS UC 90Ω
R1	100 ohms
FS1	250mA quick blow, ES4265
C1	2μF

Fig.5 Teleview line switching