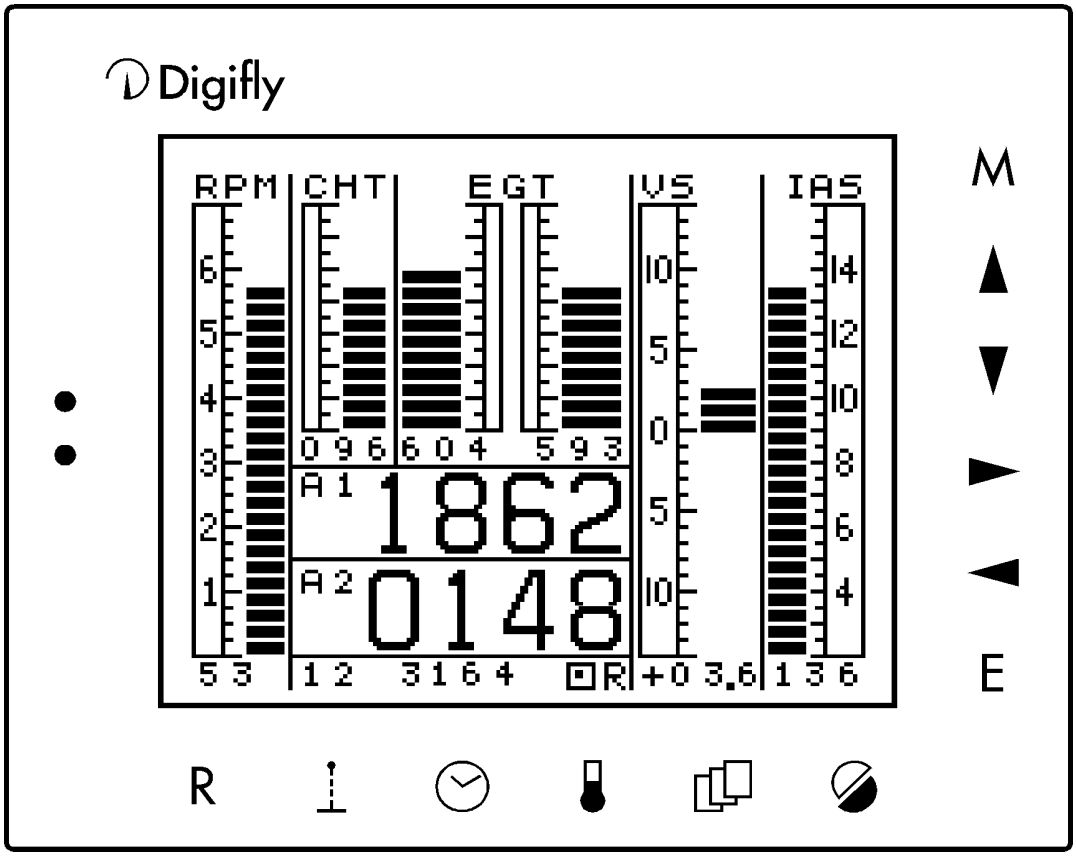

figure 1

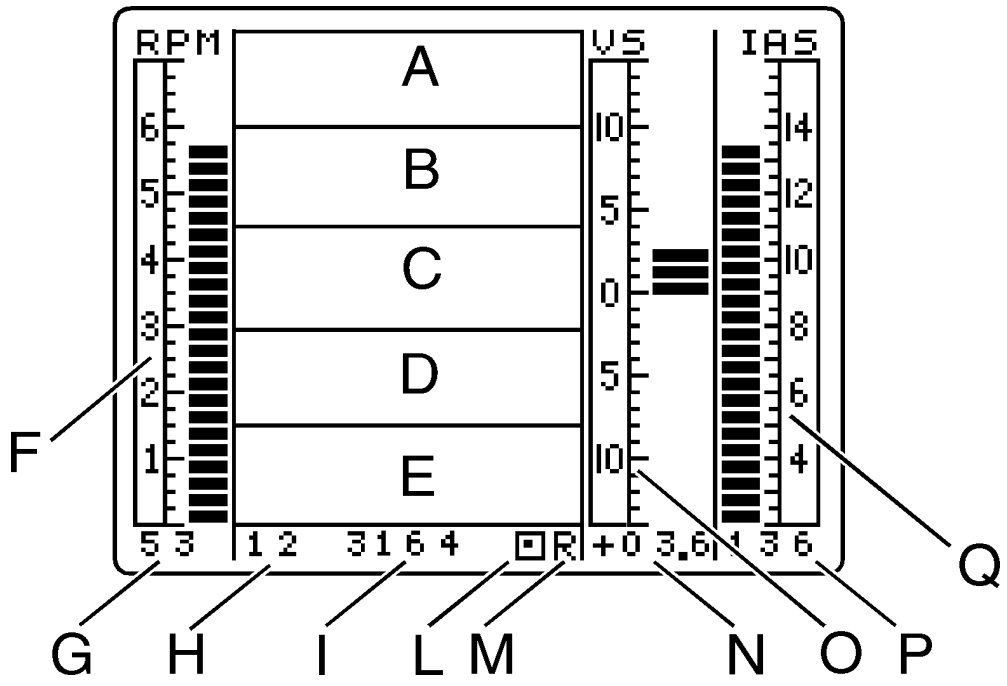

figure 2

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1 BBC GENERAL DESCRIPTION

1.0 Installing and Turning on the BBC for the First Time

Installing the BBC will only take you a few minutes, the various components being wired and tested before delivery. The following simple operations should be performed:

a) Choose a mounting location for the BBC. (Make sure the place you choose is not subject to excessive mechanical and electrical stress). Direct exposure of the various elements making up the system to atmospheric agents should also be avoided whenever this is possible.

b) Mechanically fasten the temperature probes to the special locations indicated by the engine manufacturers.

c) Position the pitot tube, the dynamic intake, the static intake and the connection tubes. Be extremely cautions not to throttle the tubes or let foreign matters into the anemometer components.

d) Connect the unit to a 12 Vdc battery using the supplied fuse,then plug in the patch cord, the BBC240EU or BBC240EUD and the probes as is shown in the wiring diagram (Table 3).

e) Make sure that instrument settings are in accordance with the aircraft characteristics - using the SETUP function in the DIAGNOSTICS menu (see 3.8).

f) Before starting to fly, make sure that the instruments are working correctly both when the engine is running and when it is stopped.

1.1 Power on

Turn on with the special switch. Your BBC will execute a self-check lasting about two seconds, and will then be ready for flight. The selected instruments are displayed.

1.2 Contrast and Backlighting

The display contrast can only be adjusted using keys [►] and [◄] if the START function has been selected; backlighting can always be turned on and off using key [◍].

1.3 Analog Rev Counter

The analog revolution counter (Fig. 2 Pos. F) shows the number of engine revolutions both on a scale made up of 28 bars and with a two-digit number placed below. (Fig. 2 Pos. G).

The counter alarm thresholds and end of the scale value can be entered with SETUP.

1.4 Analog Variometer

The analog variometer (Fig. 2 Pos. 0) shows vertical speed values on a scale made up of 28 bars (each bar corresponding to one meter) and with a number placed below (Fig. 2 Pos. N).

1.5 Analog Anemometer

The analog anemometer (Fig. 2 Pos. Q) displays the indicated air speed (IAS) on a scale made up of 28 bars and with a number placed below (Fig. 2 Pos. P).

The anemometer alarm thresholds and end scale value can be entered with SETUP.

1.6 Voltmeter

The voltmeter (Fig. 2 Pos. H) shows the battery voltage.

This voltage should never be lower than 10 Volts: if this is the case, an alarm message

is displayed so that incorrect values need not be shown.

1.7 Hour Counter

The hour counter (Fig. 2 Pos. I) shows the number of engine working hours. This value can be entered using the SET UP function in the diagnostic menu (see 3.8).

1.8 Date Indicator

The date indicator is located in the lower part of the fourth screen. It displays the current date using the day / month / year format.

1.9 Screen Number Indicator

The screen number indicator (Fig. 2 Pos. L) shows which one of the three graphic instrument screens is being used.

1.10 Data Entry

The data recorder is a BBC built-in device allowing the following data to be stored: pilot name, aircraft type, takeoff date and time, landing time, 3600 barographic points and minimum and maximum values reached.

The 3600 barograph points are used to store altimeter A1 readings every n seconds (1 to 30 second intervals can be selected) up to a total recording time of 30 hours.

Minimum and maximum values are those recorded by altimeter A1, by the anemometer, variometer and rev counter.

The data recorder is started by depressing keys [▲] and [E] one after the other and can be turned off either using keys [▲] and [▼] or automatically - at the end of the maximum recording time.

When the data recorder is on, the letter “R” is displayed in the lower part of the screen (Fig. 2 Pos. M).

WARNING! Whenever a new recording is started, the old data is erased. Important data should therefore be printed or transferred into a personal computer.

2 DESCRIPTION OF RELOCATABLE INSTRUMENTS AREA

2.0 Description of Relocatable Instruments

The instruments described hereabove are located in a fixed screen area. Another series of instruments can be positioned at will in one of the five special areas (Fig. 2 Pos. A-B-C-D-E) of the screen (with the exception of the graphic altimeter and the analog thermometers, which need to be positioned in the top areas).

By simply depressing key [▣], you can select one of the three graphic screens or the ten instrument screen. To select the desired instruments, use the SET SCREENS function (see 3.6).

2.1 Graphic Altimeter

It graphically displays flight progress using altimeter A1 readings. To enter values on the x axis (Secs) and on the y-axis (m) see 3.3.

2.2 Altimeter A1

Altimeter A1 shows the altitude in m; it has a -300 to +9000 m range and 1 m resolution. It can be set both in m and in mB (see 3.2). The recorded altitude value in m is calculated as a function of the atmospheric pressure, of its different vertical distribution and of

ambient temperature.

2.3 Altimeters A2 / A3

Altimeters A2 and A3 have the same characteristics as altimeter A1, their range reaching however -9000 m. They can also be reset by simply pressing key [R].
If used in this way, besides being normally used as QNH and QFE value indicators, they can also be two practical indicators of altitude gain or loss. Selection of altimeter 2 or 3 is done by depressing key [ ].

2.4 Clock / Timer

The double-acting clock / timer instrument can show either the current hour/minutes or the timer function.
Keys functions:

[E] clock/timer switch.

[ ] START/STOP timer (if timer instrument selected).

[ ] timer reset (if timer instrument selected) or RPB pressed more than 2 seconds.

[ ] shifts timer from **hh:mm** format to **mm:ss** format and viceversa.

2.5 Barometer

The barometer instrument shows the atmospheric pressure.

2.6 Digital Anemometer

The digital anemometer displays a giant-size number showing the anemometric speed.

2.7 Digital Variometer

The digital variometer displays a giant-size number showing the vertical speed.

2.8 Digital Rev Counter

The digital rev counter displays a giant-size number showing the engine rpm.

2.9 CHT 1 / Digital Water Temperature / Digital Oil Temperature

Thermometer CHT1 shows the temperature in cylinder 1, the temperature of water in the cooling system or the temperature of engine oil. Selection of one of the three instruments can be executed using SETUP.

2.10 CHT 2 / Digital Water Temperature / Digital Oil Temperature

Thermometer CHT2 shows the temperature in cylinder 2, the temperature of water in the cooling system or the temperature of engine oil. Selection of one of the three instruments can be done using SETUP.

2.11 Digital EGT 1

Digital thermometer EGT 1 displays a giant-size number showing exhaust gas temperature 1.

2.12 Digital EGT 2

Digital thermometer EGT 2 displays a giant-size number showing exhaust gas tempera-

ture 2.

2.13 Digital Carburetor Temperature

The carburetor thermometer displays carburetor inlet air temperature.

2.14 Digital Outside Air Temperature

The outside air temperature thermometer displays outside air temperature.

2.15 Digital Rotor Rev Counter

The digital rotor revolution counter displays rotor rpm.

2.15 Analog CHT 1 / EGT 1/ EGT 2

When this threefold instrument is selected, three separate groups of 14 bars each are displayed showing temperatures CHT 1, EGT 1 and EGT 2. The scale lower limit, single bar and alarm threshold values can be programmed for each instrument (see SETUP).

3 DESCRIPTION OF FUNCTION MENU

3.0 Retrieval of Function Menu

The general menu of functions can be retrieved at any time by simply depressing key [M]. Select by moving the cursor to the the desired function using the special keys [▲] or [▼], then enter your choice with key [E].

3.1 Start

By selecting function Start (1) you can control main screen instrument display. From “Start”, the display contrast can be modified using keys [►] and [◄].

3.2 Set Altimeters

By selecting function Set Altimeters (2), you can set one of the three BBC altimeters in two different ways, i.e. either in m or in mB. Setting an altimeter in meters means to enter the current altitude value in meters, while setting an altimeter in mB means entering the pressure of a point with respect to which you wish to find out the difference in height (meters).

Setting altimeters in mB proves particularly useful during transfer flights and in all other situations when several aircrafts are flying together, and it is recommendable that all altimeters be set to the same pressure (ex. 1013 mB).

3.3 Set Barographs

Selection of the Set Barographs function (3) is done to carry out one of the following operations:

1) Set Sampling , to select the number of seconds bewtween one barograph sampling and another.

2) Set Window X , to select the number of seconds between one graphic altimeter updating and another.

3) Set Window Y , to select the value in meters of each point on the graphic altimeter y-axis.

3.4 Set Variometers

By selecting function Set Variometers (4), you can enter variometer inertia.

3.5 Set Timer

Selection of the Set Timer function (5) is necessary to execute one of the following operations:

1) Set Date (to enter today's date)

2) Set Time (to enter current time).

3.6 Set Screens

The Set Screens function (6) is used to choose the instruments to display on four screens. Proceed as follows:

a) select a screen to modify from the screen menu

b) enter the desired instrument codes in the special areas then press key [E].

Any instrument combination can be entered, except for graphic altimeter and analog thermometers which must be located in top areas.

3.7 Moviola

The Moviola function (7) is the BBC most innovating function as it allows all data concerning the latest recorded flight to be reviewed on the screen.

The above data can be displayed in two ways:

1) Graphically - If you select this mode, your BBC will first of all present the whole flight on its display, independently of flight length. Then you will be able to analyze every single screen point by simply pressing keys [►] and [◄].

For each point in the graphical representation, altitude (in m) and absolute or relative time values will be shown. Use key [⏲] to shift from absolute to relative time and vice versa. After moving the cursor to the graph point you wish to magnify, press key [⧉].

When the ZOOM (magnification) is on, the following keys are also enabled:

key [⤒] moving the cursor backwards by one page, key [⤓] moving the cursor forwards by one page, keys [▲] and [▼] centering the graph in the screen, and key [R] allowing ZOOM amplification parameters to be changed. There are two ZOOM amplification parameters: the range value to be displayed (in m) and the sampling time multiplying factor.

To turn off the ZOOM depress key [⧉] once more.

To return to the previous menu, press key [M].

2) Minima and Maxima - If you select this mode, your BBC will display a table containing data concerning the recorded flight, i.e. flight date, takeoff time, landing time and minimum and maximum values reached. Minimum and maximum values are those recorded by altimeter A1, by the anemometer, variometer and rev counter.

To return to the previous menu, press key [M].

3.8 Diagnostics

Function Diagnostics (8) can be used to execute the following operations:

1) and **5) DIAG** to execute inner tests (for service use only).

2) SETUP to enter programmable instrument scales.

MT/FT> MT=0 FT=1
KM/M/K> KM=0 MPH=1 KNOTS=2

ANEM FS> (grid is displaied only if standard 160 Km/h or 85 Mph or 85 knots end of scale is selected)
AV (number of anemometer averages)> typ=2
D(LCD delay-anemometer-)> typ=2

RPB (right push button)> timer start-stop-reset=0
reset A2-A3=1
screen back=2

ENG> NO=0 YES=1

C/F> °C=0 °F=1

CHT1> NO=0 CHT=1 H2O=2 OIL=3
CHT2> NO=0 CHT=1 H2O=2 OIL=3
EGT1> NO=0 YES=1
EGT2> NO=0 YES=1
OAT> NO=0 YES=1
CARB> NO=0 YES=1

CHT BS(scale lower limit)> typ=050 BV(single bar value)> typ=10
EGT BS(scale lower limit)> typ=400 BV(single bar value)> typ=20
RPM FS(end of scale value)> typ=70 D(LCD delay)> typ=2

POLES> poles number of magneto generator
ROT> number of teeth of rotor wheel NO=0

HOURS CNT> set engine hours number

3) WARNINGS to enter programmable alarm thresholds.

	MIN	MAX
ANEM	typ=20	typ=150
RPM		typ=6500
ROT	typ=100	typ=500
EGT1		typ=650
EGT2		typ=650
CHT1		typ=240
CHT2		typ=240
OAT	typ=-20	typ=+45
CARB	typ=+05	typ=+45

WARNINGS OUT> continuos light=0 blinking light=1

4) TX MODE to enter data retransmission to BBC 240DU or BBC 57XX or BBC 140DU.

ALTIM	TX>	NO=0	YES=1
VARIO	TX>	NO=0	YES=1
ANEM	TX>	NO=0	YES=1
VOLT	TX>	NO=0	YES=1
ENG	TX>	NO=0	YES=1

3.9 Agenda

Selection of the Agenda function (9) is used to display or change six messages containing 18 alphanumeric characters each.

3.10 Pilot Data

Function Pilot Data (10) is selected to change the aircraft or pilot names. These two data can contain letters, numbers and gaps up to a maximum of 18 characters each.

3.11 PC Link

The PC link function (11) is used to transfer data and information from the BCC to peripherals in the following ways:

1)PC connection - Using PC MS-DOS specially designed software, all recorded flights can be transferred, stored on a floppy disk and rerun. An electronic flight log book can be obtained in this way using a common diskette.

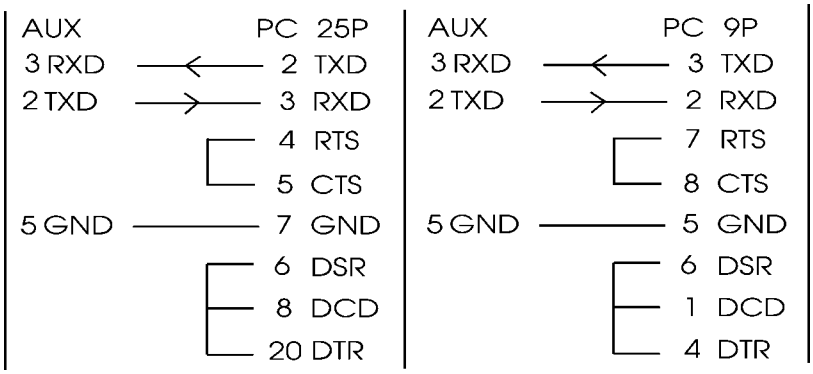
4.1 TECHNICAL DATA

Altimeters A1 A2 A3
Range -300 +9000 Mt
(-1000 +30000 ft)
Resolution 1 Mt (3 ft)
can be set in mt ft mb hPa
Graphic Altimeter

Water Thermometer
Oil Thermometer
Range 0 120 °C
(32 248 °F)
Resolution 1 °C (1 °F)
Carburetor Thermometer

4 TECHNICAL DATA

4.0 Serial Interface



N.B. EFFECT CONNECTIONS WITH TURNED-OFF EQUIPMENTS

SERIAL PORT RS232C =
9600 BAUD
8 DATA BIT
NO PARITY
2 STOP BIT

Range (ref. A1 A2 A3)
Resolution (ref. A1 A2 A3)
X and Y axis adjustable
X and Y axis adjustable

Variometer
Range -25 +25 m/sec
(-5000 +5000 fpm)
Resolution 0.1 m/sec (20 fpm)
Inertia adjustable

Anemometer
Range 0 350 Km/h
(0 217 mph) (0 188 kts)
Resolution 1 Km/h
(1 mph) (1 kt)

Barometer
Range 300 1050 mB
Resolution 1 mB

Revolution Counter
Range 0 9990 RPM
Resolution 10 RPM

Rotor Rev. Counter
Range 0 999 RPM
Resolution 1 RPM

Thermometer CHT1
Thermometer CHT2
Thermometer EGT1
Thermometer EGT2
Range 0 1000 °C (32 1832 °F)
Resolution 1 °C (1 °F)

Outside Air Thermometer
Range -30 +70 °C
(-22 +156 °F)
Resolution 0.5 °C (1 °F)

Voltmeter
Range 0 15 Volt
Resolution 0.1Volt

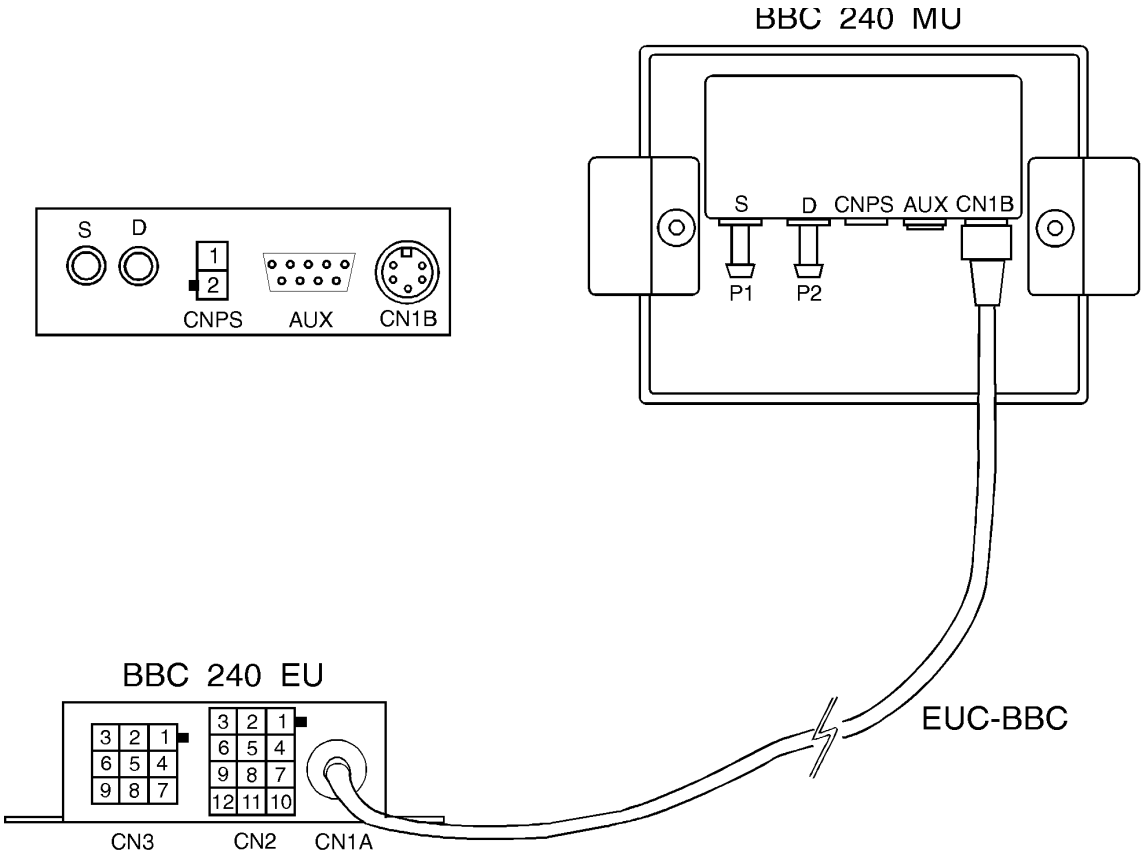
Hour Counter
Adjustable 0 9999 hours

Flight Timer
Range 0 99 hours
Resolution 1 second

Barograph
Max Time 30 hours
Frequency 1 to 30 sec.

Data life time 10 years
Agenda
Date and time
Pilot's data
Adjustable screens
Moviola and zoom
PC Interface
Back-lighting
Power supply 11.5 - 14 Vdc
Consumption 140 mA
Total weight 950 grams
Dim WxHxD (mm) 145 x 120 x 88

Table 1


BBC 240 MU
S D CNPS AUX CN1B
P1 P2
S D
1 2
CNPS AUX CN1B
BBC 240 EU
3 2 1
6 5 4
9 8 7
12 11 10
CN3 CN2 CN1A
EUC-BBC

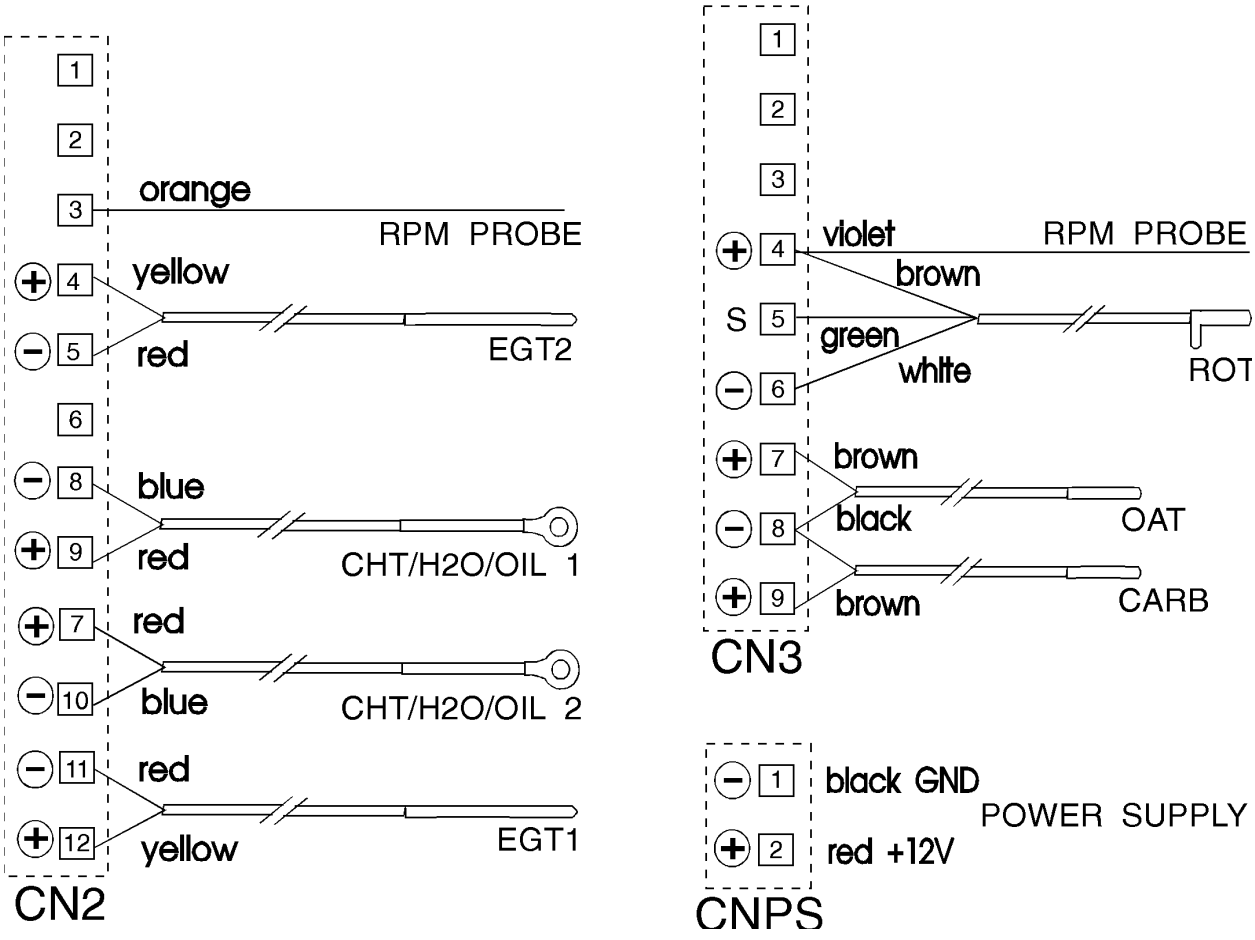

1
2
3
orange
RPM PROBE
4
yellow
5
red
EGT2
6
8
blue
9
red
CHT/H2O/OIL 1
7
red
10
blue
CHT/H2O/OIL 2
11
red
12
yellow
EGT1
CN2
1
2
3
4
violet
RPM PROBE
brown
S 5
green
6
white
ROT
7
brown
8
black
OAT
9
brown
CARB
CN3
1
black GND
POWER SUPPLY
2
red +12V
CNPS

Table 2

N.B.: - CONNECT RPM PROBE TRYING TO PLACE IT NEAR BBC 240 EUD AS POSSIBLE.
- IF YOU HAVE FALSE DATA ON RPM AT HIGH RPM VALUES, INVERT THE TWO YELLOW WIRES.

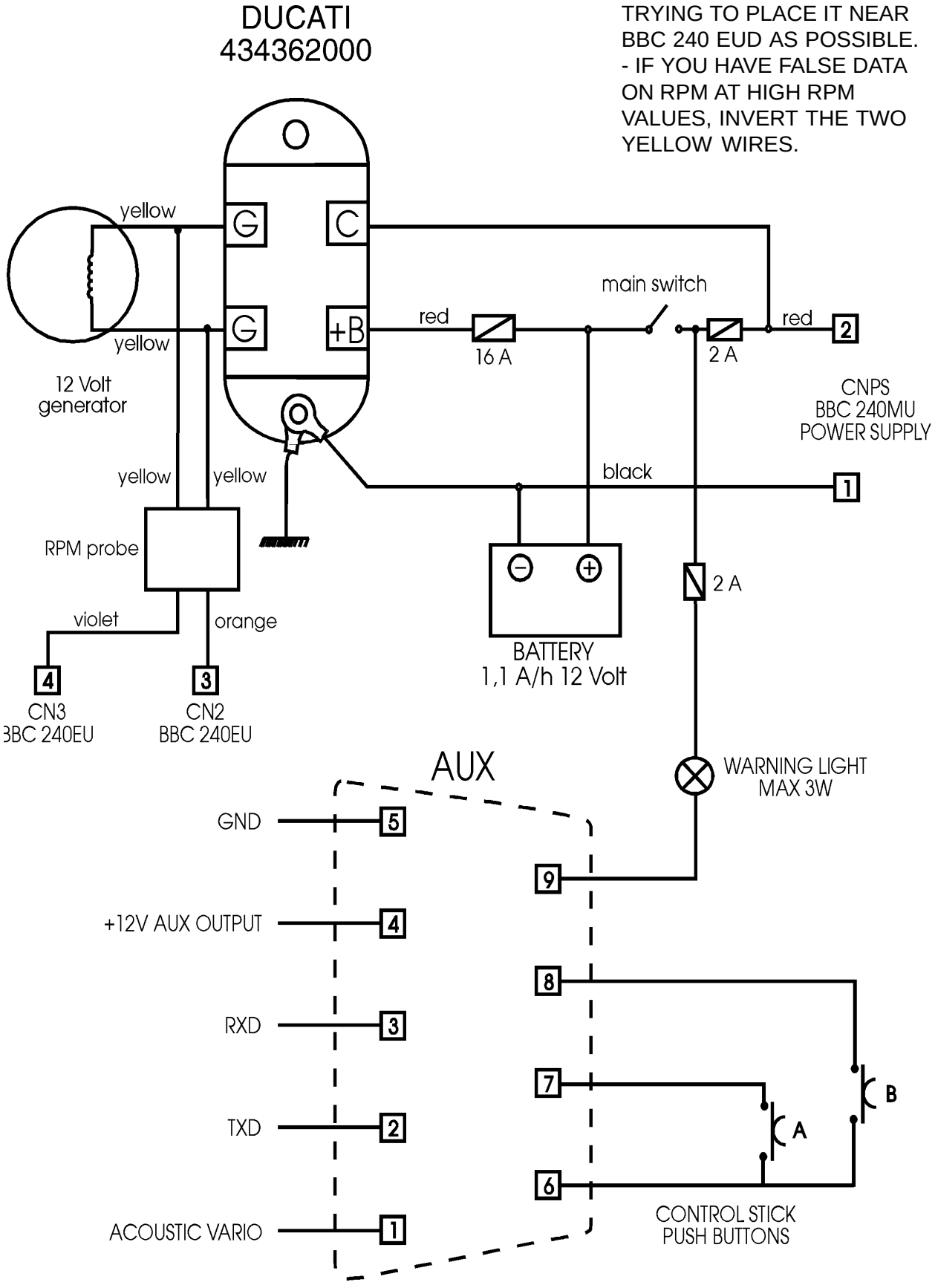


Table 3