WAVETEK datron

USER'S HANDBOOK SERVICING HANDBOOK

Model 4922

Alternating Voltage Measurement Standard

SUPPLEMENT TO USER'S HANDBOOK - 4922 WIDE-BAND MODULE

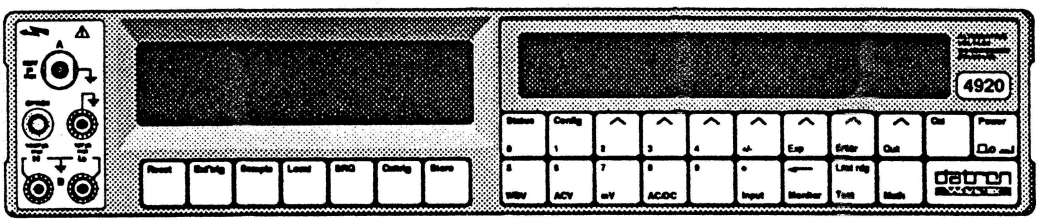
4920

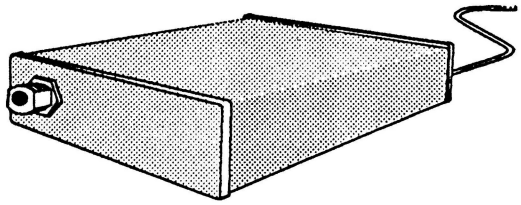
Alternating Voltage Measurement Standard

datron

WAVETEK

Supplement to Section 1 Model 4922 (Option 50 for the Model 4920) Introduction and General Description





Standard Measurement Facilities

Basic Configuration

The Model 4922 is a wide-band RMS-DC thermal voltage converter, with a single 3V range from 1V to 3.5V; 10Hz to 50MHz; 1-year specifications ±0.1% (10Hz-40Hz) to ±2.0% (30MHz-50MHz); input VSWR < 1.02 : 1 at 50Ω.

The 4922 is designed to be used (as Option 50) in conjunction with the Model 4920 Alternating Voltage Measurement Standard. Power for the 4922 is derived from the 4920, via an eight-way LEMO connector. This also carries DC and LF signals to and from the A-D Converter in the 4920.

Other Features

- **Menu Control** - flexible and easy to use.
- **Calibration** - Autocal external calibration.
- **Remote Control** - Fully IEEE-488.2 programmable

Message Readout

Generally, the selections offered in the menus reflect the availability of facilities, incompatible combinations being excluded. Nevertheless, the menu display doubles as a message screen, giving a clear readout of information to the user such as unsuitable attempts at configuration, test failures and some other conditions which would need to be reported to a Datron service center. The 4922 is also supported by these messages.

Accessories

The 4922 (Part No. 401076, complete with attached Cable Assembly) is supplied with the following accessories:

Description	Part Number
50Ω 'N' Terminator Assembly	401077
4922 Presentation Case	450958
N Male/BNC Female Adapter	630384
N Male/N Male Adapter	630390

Transfer Sequence (Refer to Fig. 1.2)

Three readings are made to determine the precise RMS value of the signal. The first is an estimate, which is a function of the gain of the Thermal Converter, and the other two are used to determine that gain and then apply corrections to the first reading. Figure 1.2 shows the arrangement of the elements in the loop; the positions of switches Sa and Sb are altered by firmware to generate the sequence of the three readings. Switch Sc closes as Sb closes and Sa opens, providing a matched termination at the WBV input when the thermal converter is disconnected by Sa.

First Reading (Ra):
The uncorrected RMS value of the input signal (Vwb) is allowed to settle for 10 seconds, and the thermal converter is measured directly by the A-D and processor (average of 4 conversions).

Sa closed drives the Thermal Converter from Vwb;
Sb/Sc open prevents the chopper output from interfering with the reading.

Second Reading (Rb):
Vref, derived from the first reading Ra and the inverse of the thermal converter transfer function, is output via the 12-bit D-A and applied to the inverter input. The thermal converter input is sourced from the chopper output so that it can settle to 1% of the change of input value.

i. Vref is measured by the A-D and processor (average of 4 readings);

ii. The inverter output is also measured (average of 4 readings) so that any offsets from the inverter can be removed digitally in the final calculation.

Sa open Vwb is removed;
Sb/Sc closed the chopped Vref is applied to the thermal converter (approx. 7 seconds settling).

Third Reading:
(Rc) The output of the thermal converter in response to chopped Vref is measured by the A-D and processor (average of 4 readings).

Sa open Vwb is not applied;
Sb/Sc closed drives the thermal converter from the chopped Vref for the reading;

Final RMS Computation

If the gain of the system is G (not precisely known), then:

$$Ra = G.Vwb(RMS);$$

so

$$Vwb(RMS) = Ra / G.$$

Rb and Rc are combined to determine G very precisely:

$$G = \text{Transfer Reading / Transfer Reference} = Rc / Rb.$$

This is used to eliminate G:

$$\mathbf{Vwb(RMS) = Ra.Rb / Rc.}$$

(Continued Overleaf)

Supplement to Section 2
4922 Installation

This section contains information and instructions for unpacking and installing the Datron 4920 Selfcal Digital Multimeter. It also introduces the layout of controls on the instrument.

Unpacking and Inspection

Every care is taken in the choice of packing material to ensure that your equipment will reach you in perfect condition.

If the equipment has been subject to excessive handling in transit, the fact will probably be visible as external damage to the shipping carton.

In the event of damage, the shipping container and cushioning material should be kept for the carrier's inspection.

Unpack the equipment and check for external damage to the case, sockets, keys etc. If damage is found notify the carrier and your sales representative immediately.

Standard accessories supplied with the instrument should be as described in the Supplement to Section 1 page 1-3.

Installation

Power Supplies
The power supplies for the 4922 are available from the OPTION LEMO socket on the front panel of the 4920. DC and signals also pass through this socket.

Connection
The 4922 is easily installed. All that is required is to plug the eight-way connector, at the rear of the unit, into the 4920 front-panel OPTION socket.

Module Settling Delay
The module powers-up as soon as it is connected. After plugging the 4922 into a powered and warmed-up 4920, a settling delay of 30 minutes is required before the module reaches full specification.

With the 4922 already connected to the 4920: after setting 4920 power on, the module's settling delay is well within the required 90 minutes settling time for the 4920.

Signal Input Connection
Connection of the wide-band input signal is through the single 'N' socket on the front of the module.

Adapters
An adapter is provided in the option kit for a 50Ω BNC termination. A second adapter (N male/N male) is provided for connecting an N female cable termination. These adaptors can also be used for Input A on the 4920 front panel.

50Ω Termination
A 50Ω co-axial thru-termination is provided in the option kit. This provides an increase in the frequency response of the 4920 Channel A high-accuracy input to 1MHz, at input levels up to 7V.

Connectors and Pin Designations

Inputs

One N-type coaxial plug is fitted on the left of the front panel. It carries the 50Ω input to the wideband analog circuitry.

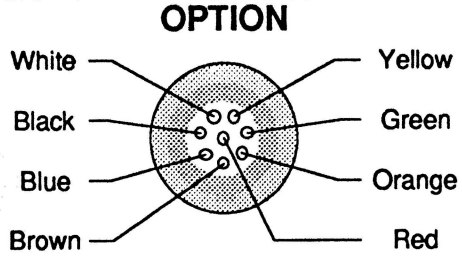
Wide Band Cable Assembly

The Cable Assembly (pt. no. 401075) is a screened eight-way cable, terminated at one end to circuit points on the 4922 pcb, and on the other by a LEMO plug.

The cable carries common 0V_14 supplies from the 4920 to power the 4922 circuitry, a line to detect the presence of the module, and four signal lines which permit the 3-reading process to be employed for wideband measurements.

Pin Layout

The following diagram shows the layout of the wires in the cable, viewing the 4920 front panel OPTION socket from the front of the 4920.



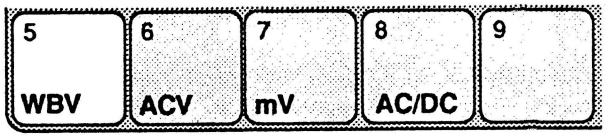
Pin Designations

Wire Color	Signal Name	4922 pcb Termination
YEL	+11V	E2
GRN	-19V	E5
ORG	WB_PSU_GND	E4
BRN	TTAMP_OP	E7
BLU	WB_FREQ	E9
BLK	DC_CHOP	E6
WHT	ACHF-L	E8
RED	0V_14	E3
GRN/YEL	SCREEN	E1

Supplement to Section 3 Model 4922 Basic Measurements

Menu Keys

For the 4922, a front panel menu key has been allocated (the major function key **WBV**). This key opens the WBV menu.



Major Function Key:

WBV (Wide Band Voltage) - 10Hz to 50MHz, max. input 3.5V RMS @ 50Ω
This function key defines a separate measurement state and activates its corresponding menu on the display. Changing a selection therefore commands a change of measurement state.

The WBV function has its associated WBV CONFIG (Configuration) menu, which we can use to set up the 'function-dependent' parameters: resolution and filter settings. Once set up, the instrument remembers the pattern of parameter conditions in that function, so that when we reselect it on a later occasion, it remains set up as before until we change it or turn off the instrument power.

WBV Menu

Entry to WBV Operation

ACV is the Power-On and Reset default connection for the 4920. If WBV is required, certain conditions must be met to ensure that traceable wideband measurements are possible. In all WBV measurements, the 4922 module forms part of the circuitry external to the 4920.

4922 not connected

If the 4922 module LEMO connector is not plugged into the 4920 OPTION socket, an execution error willbe reported when the **WBV** key is pressed:

After the connection has been made, the power is applied to the module, and the measurement circuits are completed. An 'option-fitted' line detects the presence of the module, so pressing the **WBV** key again will open the WBV menu (unless it has not been opened since power-on, in which case, a further barrier is imposed).

WBV not used since power-on

Each particular 4922 module is calibrated in conjunction with a particular 4920, which holds the characteristic correction constants in its non-volatile memory. Subsequently, if traceability is to be maintained, the characterized 4922 must travel with the instrument, to be used for all WBV measurements.

To this end, all 4922 modules are serial-numbered. At calibration, the serial number of the *characterized* module is registered in the non-volatile calibration memory of the 4920, so that users can ensure that the correct module is connected. When first attempting to open the WBV menu after power-on, the correct serial number must be entered before the 4920 will permit WBV measurements to proceed.

WBV Menu continues overleaf ☞

WBV Menu

☞ Press the **WBV** key to see the WBV menu:

This menu defines the following *choice* keys.

Ranges: The 3V range is the only available range.

Instrument Status Reporting

☞ Press the Status key to see the STATUS report:

Status is a complete report of the most recent selections made using any of the various menus. It can be used at any time as a fast means of checking that the 4920 selections are suitable for the measurement being made.

The legends shown in the above diagram do **not** actually appear, they only mark the approximate positions for legends which can appear. Each is an abbreviation which merely acts as a key to the list below. The meaning and possible parameters which appear in each position are given in the list:

Abbr.	Meaning	Possible Parameters
FNC:	Function	ACV, mV, WBV.
RNG:	Range (ACV)	0.3V, 1V, 3V, 10V, 30V, 100V, 300V, 1kV.
	Range (mV)	3mV, 10mV, 30mV, 100mV.
	Range (WBV)	3V.
RMS:	Low Frequency Limit	1Hz, 10Hz, 40Hz, 100Hz.
FIL:	Digital Filter	Off, AV4, AV8, AV16.
INPUT:	Input Channel	ChA, ChB.
DCPOS; DCNEG; DCRMS; TFER:		
	AC/DC Transfer	If present, AC/DC Transfer mode is active.

Supplement to Section 4 Model 4922 Using the 4920/4922

Preliminaries

This section details the methods of using the instrument, divided so as to provide an easy reference for particular functions and facilities. The divisions are as follows:

Functions	Facilities
AC Voltage,	Status Reporting,
WB Voltage,	Monitoring,
Millivolts,	Math (average),
AC/DC Transfer	Test,
	Calibration.

The descriptions include: methods of connection, input limits, types of configurations, methods of access to facilities, and calculations available.

Where appropriate, examples of procedures are given in a format similar to that used in Section 3. Although the menus for calibration are shown, all routine calibration should be referred to Section 8.

Installation

Before using the instrument, it is important that it has been correctly installed as detailed in Section 2.

Limiting Characteristics

Maximum inputs are detailed in Section 6.

Safety

The 4920 meets the safety requirements of UL 1244, ANSI C39.5 (Draft 5) and BSI 4743. Protection is provided by a direct connection via the power cable from ground to exposed metal parts and internal ground screens. The power cable line connection must only be inserted in a socket outlet provided with a protective ground contact, and continuity of the ground conductor must be assured between the socket and the instrument.

WARNING:

Any interruption of the protective ground conductor inside or outside the instrument, or disconnection of the protective ground terminal may make the apparatus dangerous. Intentional interruption is prohibited. The terminals marked with the ⚡ symbol carry the input to the 4920. These terminals and any other connections to the source under test could carry lethal voltages. Under no circumstance should users touch any of the front or rear panel terminals unless they are first satisfied that no dangerous voltage is present.

CAUTION:

The ⚠ symbol is used to remind users of special precautions detailed in this handbook, and is placed next to terminals that are sensitive to overvoltage conditions.

Setup Sequence

The following sequence of operations is arranged so as to configure a WBV measurement rapidly from the default state. In general, it is quicker to use toggle or choice soft keys on one menu before selecting another menu key.

Obviously, once the instrument has been set up to one configuration, that is the starting point.

- The default function is ACV, and the default range state (1kV) is shown automatically on the ACV menu.

N.B. If the instrument is being set into WBV function for the first time since power-on, certain conditions are imposed to ensure that:

a. the 4922 is correctly plugged into the OPTION socket on the 4920 front panel.

b. the 4922 is the specific module that has been characterized by calibration in conjunction with this specific 4920.

- Press the **WBV** key.

- The 3V range is shown automatically on the WBV menu.

4922 Wideband Assembly Test Procedure

Equipment Required.

1. DMM (1081)
2. Calibrator (4700)
3. 4920 test rig. (With WB lin cal and normal cal already stored in cal memory and with wideband option (Option 50) fitted.
4. 0.24A DC Supply
5. Wavetek 178
6. 100MHz oscilloscope.
7. 190MHz return-loss bridge.
8. 50Mhz signal source. (Part No. 950011)
9. Precision mismatch. (Part No. 950010)
10. Two BNC to BNC leads
11. Two N-type male to BNC female adaptors.

Abbreviations Used.

BUT	Board Under Test
UUT	Test Chassis
wrt	With Respect To
FSV	Factory Selected Value
i/p	Input
o/p	Output
WB	Wideband

Procedure.

1.0. Preliminary Checks.

1.1. Visually inspect the BUT for solder shorts, misplaced components, and ensure all relevant ECO's are completed. Pay particular attention to the following points:

a) Bent leads on Bulbs particularly near to the glass body.
b) Bulb connections shorting to metal base.
c) Lower metal base shorting to lead out pads.
d) S102 resistors should be vertical, not touching each other.
e) **C116** is fitted underneath **U101**.
f) Check end cap is square to the top and bottom lids.
g) Check that **Q109/Q111** and **Q110/Q112** are glued together.

1.2. Remove the shorting links from **Q105, Q107** and **Q108.**

2.0. Operation Test.

2.1. Connect UUT to test rig, switch on and allow **Oper Test** to run. Ensure that a pass is obtained.

3.0. Power Supplies.

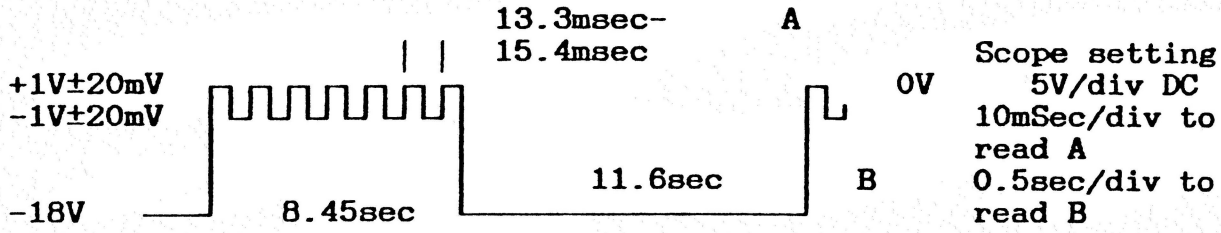
3.1. Connect the DMM and 'scope to the following test points wrt TP104 and check the following voltages. Ensure that no oscillations are present.

Voltage	Test Point	Reading	Noise
+11V	TP105	+10V to +11V	<5mV p-p
-19V	TP107	-18V to -19V	<5mV p-p
+5V	TP106	+4.75V to +5.25V	<10mV p-p

3.2. Chop Switches.

On UUT select WBV, 3V range. Apply 1V at 1kHz to the WB input. Connect the 'scope to TP108 wrt TP104 and ensure that the waveform is as shown in Fig.1 below.

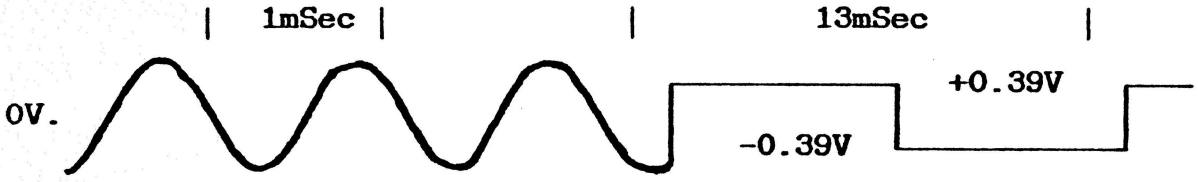
Fig.1



3.3. AC/DC Switches.

3.3.1. Connect the 'scope to TP102 (Q112 leg to rear of pcb). Apply 3V at 1kHz and ensure that the waveform is as shown in Fig. 2

Fig.2



Scope Setting:- 1V DC/div. 5mSec/div to read 13mSec.
1mSec/div to read 1mSec.

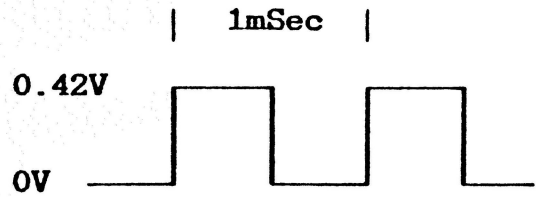
3.3.2. Ensure that the 70Hz part of the waveform does not have any 1kHz breakthrough on it.

3.4. Frequency Divider.

3.4.1. Connect the DMM to TP101 wrt TP104 and with no input signal check that the voltage measured is +2V ±0.29V.

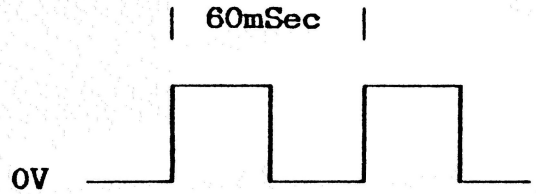
3.4.2. Select **WBV, 3V range** and apply **1V rms** at **64kHz** to the **WB** input. Connect the 'scope to **E9** and check that the waveform is as shown in **Fig.3**.

Fig.3



3.4.3. Connect the **Wavetek 178** (TE1030) from the **Function Out** socket of the **178** to the **WB input** of the **UUT**. On the **178** press **On, Freq,** and using the **Cursor** arrow keys set to **1kHz**. Press **Ampl** and using the **Cursor** arrow keys set **1V pk-pk** and then **9V pk-pk** and ensure that there is no change to the waveform shown in **Fig.4**.

Fig.4.



Scope setting:-

20mSec/div
0.5V/div

3.4.4 With the **178** set to **1V** select the following **Freq** and check with a **Frequency Counter** connected to **TP101**.

50MHz	-	781.250 kHz
20MHz	-	312.500 "
10MHz	-	156.250 "
5MHz	-	78.125 "
2MHz	-	31.250 "
1MHz	-	15.625 "
500kHz	-	7.812 "
100kHz	-	1.562 "

4.0. Input Impedance.

4.1.1. Ensure **FSV R135** is not fitted. Select **WBV** and **ExtTrig**. Connect DMM in 4 wire Ohms to **WBV** input connector and ensure that reading is between **50.06Ω** and **50.28Ω**.

4.1.2. Connect **I+** and **I-** of the **4700** to the **WB input**. Select **DCI, +60mA** on the **4700**. Adjust **FSV R135** until the voltage measured across the **WB input** is **3V±50µV**.

4.2.1. Ensure FSV R136 is not fitted. Select ACV and ExtTrig. Connect DMM in 4 wire ohms to WBV input connector and ensure reading is between 50.29Ω and 50.54Ω.

4.2.2. Connect I+ and I- of the 4700 to the WB input. Select DCI, +60mA on the 4700. Adjust FSV R136 until the voltage measured across the WB input is 3V±50µV.

5.0. **Input clamping.**

5.1. Connect DMM Hi to the cathode of D101 and DMM Lo to the anode of D101. Ensure reading is between +4.6V and +4.8V.

5.2. Connect DMM Hi to the anode of D102 and ensure reading is between -4.6V and -4.8V.

5.3. Select ACV, ExtTrig. Connect the DMM to the WB input and apply an external DC supply (TE539). Connect the Blue wire to Master - and the Red wire to Master +. Set the PSU to V,Non tracking, Isolated. Connect the PSU to the WB input, 0V selected. Sweep the voltage up to +12V across the DMM. Move the DMM to Q102. The DMM reading should be +5.7V. Increase the PSU output slightly and note that there is very little change in the reading.

5.4. Repeat step 5.3. with negative polarity input.

NOTE DC supply needs to be at least 0.24A i.e. not a calibrator.

6.0. Ensure that all FSV's are soldered. Fit A101 Guard Box Lid. Fit external covers.

7.0. **VSWR Checks.**

7.1. Set oscilloscope to Channel A, 2mV/div, 2mS/div, int trig.

7.2. Connect o/p of 50MHz signal source to Return Loss Bridge i/p.

7.3. Connect o/p of Return Loss Bridge to oscilloscope channel A, via 50Ω through termination.

7.4. Connect precision 50Ω to Return Loss Bridge port x and ensure waveform on oscilloscope is <400uV pk-pk. Disconnect 50Ω.

7.5. Connect Precision Mismatch to Return Loss Bridge port x and note the amplitude. (should be approximately 6mV pk-pk) Disconnect Precision Mismatch.

7.6. Select WBV, enter the 4922 WB module serial number, press Enter and select Ext trig.

7.7. Connect **Return Loss Bridge port x** to the **WB i/p.**

7.8. Ensure the amplitude on the oscilloscope is **>2mV less** than that noted in para. 7.5.

7.9. Select **ACV,** leaving **Return Loss Bridge** connected to the **WB i/p.**

7.10. Ensure the amplitude on the oscilloscope is **>1mV less** than that noted in para 7.5.

7.11. This completes the VSWR checks. Pass the BUT to stock.

Tests Complete.

4922 Wideband Assembly Test Procedure

Ser. No:- Operator:-

1. Preliminary Tests ..... ( )
2. Operation Test ..... ( )
3. Power Supplies ..... ( )
4. Input Impedance ..... ( )
5. Input Clamping ..... ( )
6. Solder FSV's, Fit Guard Box & Covers. ..... ( )
7. VSWR Checks. ..... ( )

4922 Wideband Assembly Test Procedure

Equipment Required.

1. DMM (1081)
2. Calibrator (4700)
3. 4920 test rig. (With WB lin cal and normal cal already stored in cal memory and with wideband option (Option 50) fitted.
4. 0.24A DC Supply

Abbreviations Used.

BUT	Board Under Test
UUT	Test Chassis
wrt	With Respect To
FSV	Factory Selected Value
i/p	Input
o/p	Output
WB	Wideband

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f) Check end cap is square to the top and bottom lids.
g) Check that **Q109/Q111** and **Q110/Q112** are glued together.

1.2. Remove the shorting links from **Q105, Q107** and **Q108.**

2.0. Operation Test.

2.1. Connect UUT to test rig, switch **on** and allow **Oper Test** to run. Ensure that a pass is obtained.

3.0. Power Supplies.

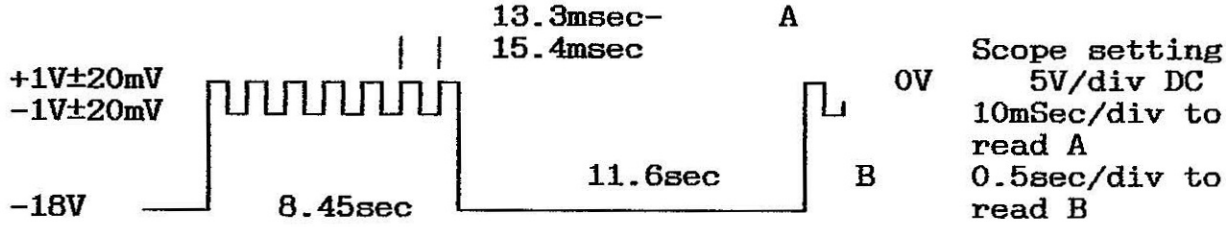
3.1. Connect the DMM and ´scope to the following test points wrt **TP104** and check the following voltages. Ensure that no oscillations are present.

Voltage	Test Point	Reading	Noise
+11V	TP105	+10V to +11V	<5mV p-p
-19V	TP107	-18V to -19V	<5mV p-p
+5V	TP106	+4.75V to +5.25V	<10mV p-p

3.2. Chop Switches.

On UUT select WBV, 3V range. Apply 1V at 1kHz to the WB input. Connect the 'scope to TP108 wrt TP104 and ensure that the waveform is as shown in Fig.1 below.

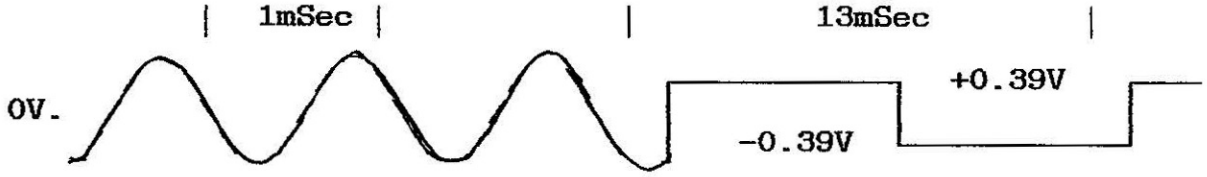
Fig.1



3.3. AC/DC Switches.

3.3.1. Connect the 'scope to TP102 (Q112 leg to rear of pcb). Apply 3V at 1kHz and ensure that the waveform is as shown in Fig. 2

Fig.2



Scope Setting:- 1V DC/div. 5mSec/div to read 13mSec.
1mSec/div to read 1mSec.

3.3.2. Ensure that the 70Hz part of the waveform does not have any 1kHz breakthrough on it.

3.4. Frequency Divider.

3.4.1. Connect the DMM to TP101 wrt TP104 and with no input signal check that the voltage measured is +2V ±0.29V.

3.4.2. Select WBV, 3V range and apply 1V rms at 64kHz to the WB input. Connect the 'scope to E9 and check that the waveform is as shown in Fig.3.

Fig.3

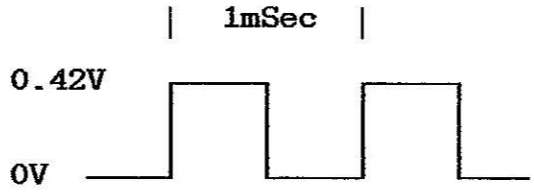


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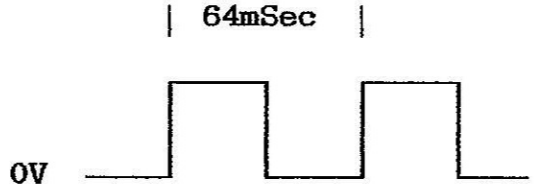
Fig.4.



Scope setting:-

20mSec/div
0.5V/div

4.0. **Frequency Readout Checks.**

4.1. Connect the **Wavetek 178** (TE1030) from the **Function Out** socket of the **178** to the **AC input** of the **UUT**. On the **178** press **On, Freq,** and using the **Cursor** arrow keys set to **1MHz**. Press **Ampl** and using the **Cursor** arrow keys set **3V pk-pk**

4.2. On the UUT select **ACV, 1V range**. Press **Cal, Freq, CalTrig** and wait for the **Busy** led to extinguish.

4.3. Select **WBV.** The message **WB Ser#=** will appear. Key in the serial number of the **4922** and press **Enter.** Connect the **Wavetek 178** to the input of the wideband unit. Set the **178** to **1V**. If there is no reading on the UUT display carry out **Wide Band Linearity Cal** as follows:- Ensure nothing is connected to the input of the wideband unit. Select **WBV.** The message **WB Ser#=** will appear. Key in the serial number of the **test rig** and press **Enter.** Press **Cal, Spcl, Yes, ALIN, CalTrig.**

4.4. With the **178** set to **1V** select the following **Freq** and check with a **Frequency Counter** connected to **TP101.** Also select **Monitor** on the UUT and check that the correct frequencies are shown on the right hand display

178 o/p		Counter	Display
50MHz	-	781.250 kHz	50MHz
20MHz	-	312.500 "	20MHz
10MHz	-	156.250 "	10MHz
5MHz	-	78.125 "	5MHz
2MHz	-	31.250 "	2MHz
1MHz	-	15.625 "	1MHz
500kHz	-	7.812 "	500kHz
100kHz	-	1.562 "	100kHz

5.0. Input Impedance.

5.1. Ensure **FSV R135** is not fitted. Select **WBV and ExtTrig.** Connect DMM in 4 wire Ohms to **WBV** input connector and ensure that reading is between **50.06Ω** and **50.28Ω.**

5.2. Connect **I+** and **I-** of the **4700** to the **WB input.** Select **DCI, +60mA** on the **4700.** Adjust **FSV R135** until the voltage measured across the **WB input** is **3V±50µV.**

5.3. Ensure **FSV R136** is not fitted. Select **ACV** and **ExtTrig.** Connect DMM in 4 wire ohms to **WBV** input connector and ensure reading is between **50.29Ω** and **50.54Ω.**

5.4. Connect **I+** and **I-** of the **4700** to the **WB input.** Select **DCI, +60mA** on the **4700.** Adjust **FSV R136** until the voltage measured across the **WB input** is **3V±50µV.**

6.0. Input clamping.

6.1. Connect DMM **Hi** to the cathode of **D101** and DMM **Lo** to the anode of **D101.** Ensure reading is between **+4.6V** and **+4.8V.**

6.2. Connect DMM **Hi** to the anode of **D102** and ensure reading is between **-4.6V** and **-4.8V.**

6.3. Select **ACV, ExtTrig.** Connect the DMM to the **WB input** and apply an external DC supply (TE539). Connect the **Blue wire** to **Master -** and the **Red wire** to **Master +.** Set the **PSU** to **V,Non tracking, Isolated.** Connect the **PSU** to the **WB input, 0V** selected. Sweep the voltage up to **+12V** across the **DMM.** Move the **DMM** to **Q102.** The **DMM** reading should be **+5.7V.** Increase the PSU output slightly and note that there is very little change in the reading.

6.4. Repeat **step 6.3.** with **negative polarity** input.

NOTE DC supply needs to be at least **0.24A** i.e. **not** a calibrator.

7.0. Ensure that all FSV's are soldered. Fit **A101** Guard Box Lid. Fit external covers.

Tests Complete.

4922 Wideband Assembly Test Procedure

Ser. No:- Operator:-

1. Preliminary Tests ..... ( )
2. Operation Test ..... ( )
3. Power Supplies ..... ( )
4. Frequency Readout ..... ( )
5. Input Impedance ..... ( )
6. Input Clamping ..... ( )
7. Solder FSV's, Fit Guard Box & Covers. ..... ( )

DRAWING_NO
DC401074

* MATCHED SET OF TWO

** MATCHED SET OF TWO

ISS	CHANGES
1.0	ECO 3949 RELEASED IJL 3 FEB 92

WB_HI
E1 SCREEN (GRN/YLW)
E2 (YEL)
E3 0V_14 (RED)
E4 WB_PSU_GND (ORG)
E5 (GRN)
DC_CHOP E6 (BLK)
TTAMP_OP E7 (BRN)
ACHF-L E8 (WHT)
WB_FREQ E9 (BLU)
TP101 TP102 TP103 TP104 TP105 TP106 TP107 TP108
NOT FITTED
U101 74HCT4060 ASYNC_BIN_CNTR/OSC
U102 OP27FZ
U103 LT1028 CN8
U104 DG411DJ
U105 MC78L05ACP
U106 74HCT4060
A101 U1-INS 5mA
Q101 BF374
Q102 BF374
Q103 BF374
Q104 BF374
Q105 SD215 DE
Q106 ZVP2106 A
Q107 SD215 DE
Q108 SD215 DE
Q109 J105
Q110 J105
Q111 J105
Q112 J105
Q113 BF374
Q114 BF374
D101 BZX79 B4V7
D102 BZX79 B4V7
D103 1N4148
D104 1N4148
D106 BZX79 C8V2
D107 1N458A
D108 BZX79 C3V9
D109 1N458A
D110 1N4148
D111 1N4148
D112 1N4148
D113 1N4148
D114 1N4148
D115 1N4148
D116 1N4148
D117 1N4148
R101 1K15 1%
R102 2K74 1%
R103 60R75 0.1%
R104 60R75 0.1%
R105 320R 0.1%
R106 320R 0.1%
R107 320R 0.1%
R108 320R 0.1%
R109 320R 0.1%
R110 320R 0.1%
R111 27R4 1%
R112 22R1 1%
R113 332R 1%
R114 357R 1%
R115 1K5 1%
R116 9K09 1%
R117 10K0 1%
R118 22R1 1%
R119 115K 1%
R120 2K00 1%
R121 200R 1%
R122 332K 1%
R123 605R5 0.1%
R124 10K 1%
R125 18K2 1%
R126 1K100 1%
R127 11K0 1%
R128 10M0 1%
R129 27K4 1%
R130 6K19 1%
R131 1K00 1%
R132 115K 1%
R133 9K09 1%
R134 39K2 1%
R135 FSV
R136 FSV
R137 100R 1%
R139 8K66 1%
R140 10R0 1%
R141 1M00 1%
R142 1K00 1%
R143 1K00 1%
R144 1K00 1%
C101 47NF 50V
C102 10UF 16V
C103 1N8F 100V
C104 270PF 100V
C105 10NF 100V
C106 NOT FITTED
C107 47NF 50V
C108 47NF 50V
C109 1NF 100V
C111 47NF 50V
C112 100PF 100V
C113 NOT FITTED
C114 47NF 50V
C115 100PF 100V
C116 30NF 50V
C117 PART7F 50V
C118 1N8F 100V
C119 1N8F 100V
C120 33UF 25V
C121 47NF 50V
C122 33UF 25V
C123 47NF 50V
C124 33UF 25V
C125 47NF 50V
C126 47NF 50V
C127 10NF 100V
L101 10UH
L102 10UH
L103 2U2H
0V
0V_14
-19V
+5V
+11V

DRAWN	JFD	DATE	31 MAY 89
CHKD	HD	DATE	13 FEB 92
APPD	PH	DATE	13 FEB 92

TITLE
4920
AC WIDEBAND PCB ASSY

datron WAVETEK
NORWICH ENGLAND

DRAWING_NO
DC401074

SHEET 1 OF 1

DRAWING No.
DA401074

NOTES

* Q109 / Q111 AND Q110 / Q112 - GLUE FLAT SURFACES TOGETHER WITH CYANOCRYLATE (900013)
(DO NOT MIX SETS
Q109, Q111 = A SET
Q110, Q112 = A SET)

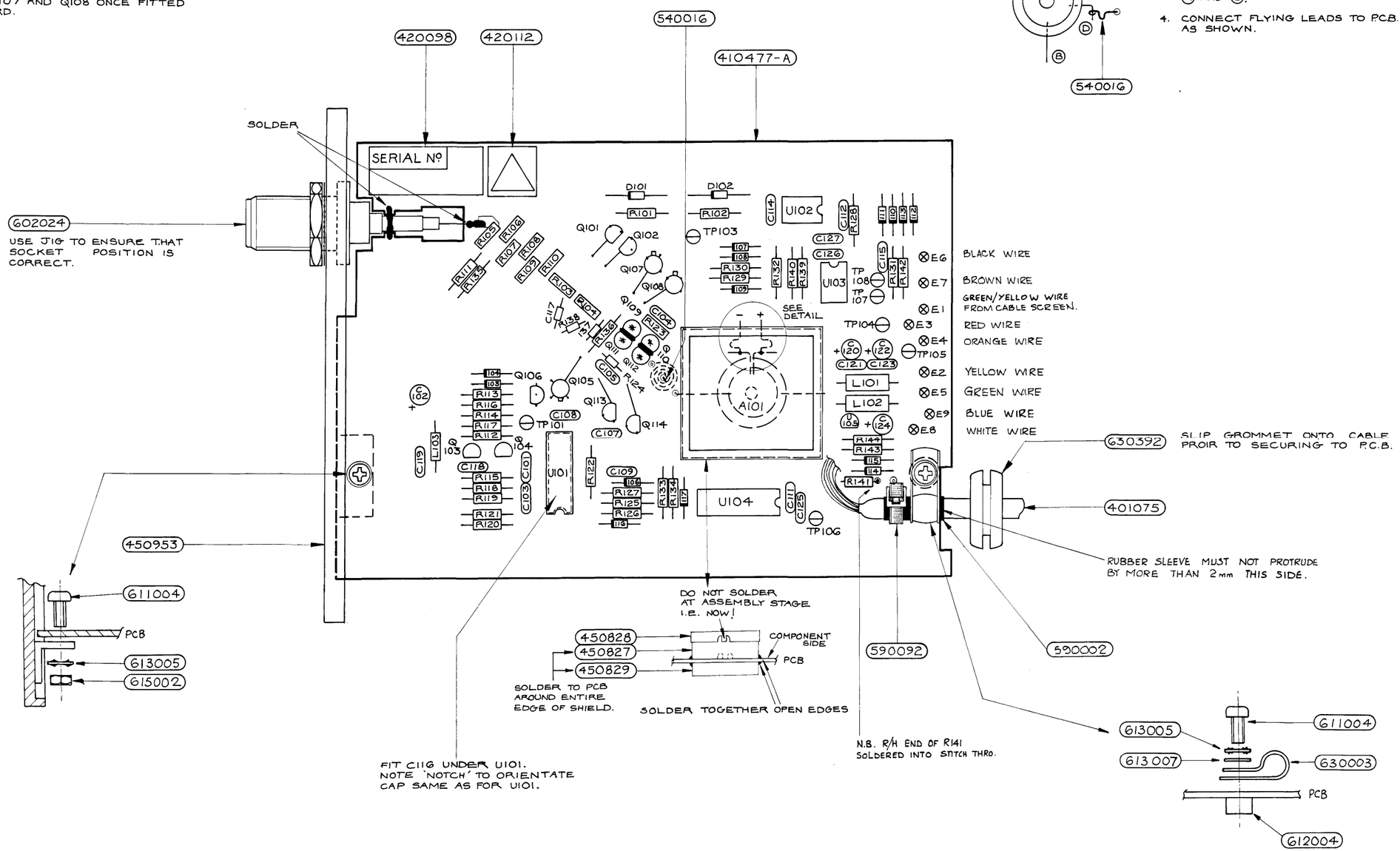
REMOVE ANTISTATIC WIRES FROM Q105, Q107 AND Q108 ONCE FITTED TO BOARD.

SOLDER LINK SHOWN USING INNER WIRE (STRIP OFF INSULATION)
N.B. FIT ON SOLDER SIDE OF PCB.

A101

1. BEND THERMAL TRANFER LEADS (C) AND (D) AS SHOWN; MAKE SURE LEADS ARE HELD BY PLIERS CLOSE TO GLASS BODY.
2. ATTACH THE TWO FLYING LEADS TO THERMAL TRANSFER LEADS (C) AND (D).
3. ATTACH THERMAL TRANSFER TO PCB BY SOLDERING LEADS (A) AND (B).
4. CONNECT FLYING LEADS TO P.C.B. AS SHOWN.

ISS.	CHANGES
1.0	ECO.3549 RELEASED AP IJL 4 FEB 92
1.1	ECO.4116 R141 WAS SHOWN JOINED TO D114(a) AP IJL 28APR92
1.2	ECO.4119 NOTE: RE RUBBER SLEEVE PROTRUDING ADDED AP IJL 20MAY92



THIRD ANGLE PROJECTION	DRAWN	DATE 2·JULY·91	DIMENSIONS IN MILLIMETRES	TOLERANCES DECIMAL TO 2 PLACES ±·1mm; DECIMAL TO 1 PLACE ±·2mm; WHOLE DIMENSIONS ±·4mm; ANGULAR ± ½° UNLESS OTHERWISE STATED	MATERIAL —	TITLE 4922 AC WIDEBAND ASSEMBLY
ALL BURRS TO BE REMOVED	CHECKED R.D.	DATE 14·2·92	SCALE NOT TO BE SCALED		FINISH —	DRAWING No. DA 401074
	APPR. PDH	DATE 14-2-92				SHEET 1 OF 1

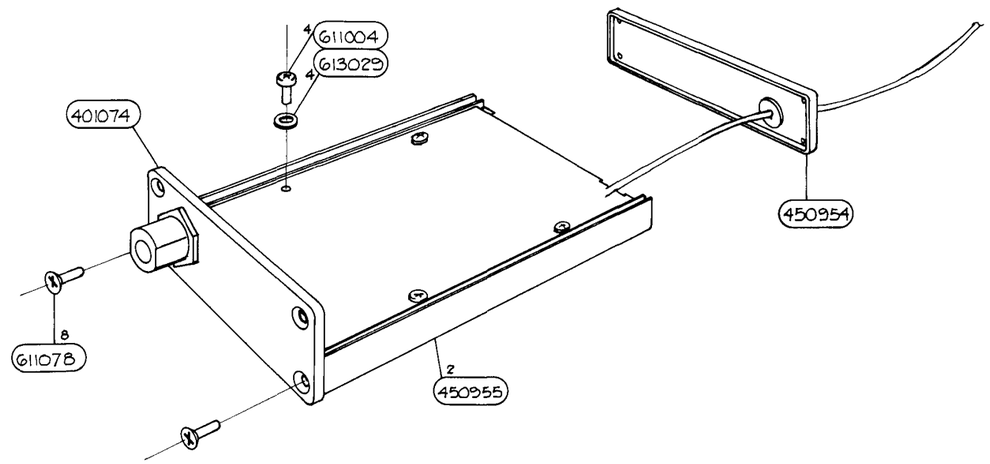
datron INSTRUMENTS NORWICH ENGLAND

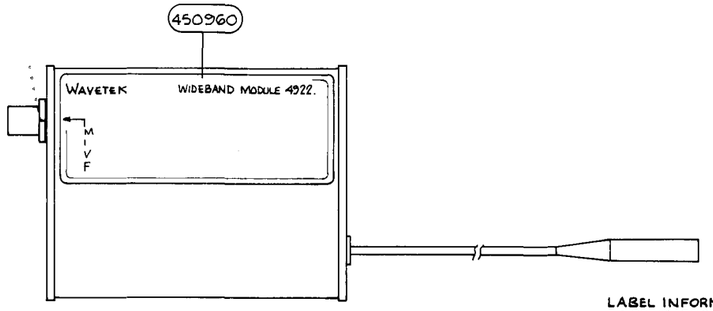
DA401074

BAYLISS WISDOM PDS 870728

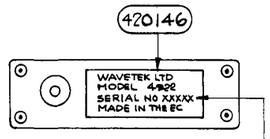
DA401076

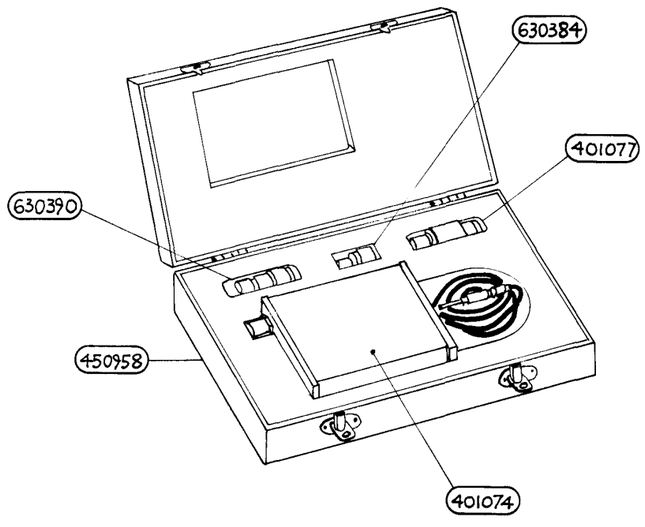
DRAWING No.
DA401076





LABEL INFORMATION TO BE MARKED AS SHOWN





ISS.	CHANGES
1.0	ECO.3949 RELEASED MD IJL 4 FEB 92
1.1	ECO.4229 SCREW 611078 WAS 611038 (8 OFF). MD IJL 22SEP93
1.2	ECO. 4693 OVERLAY 450960 UPDATED WITH NEW LOGO LABEL 420146 WAS 420095-3 MD IJL 3 JAN 95

datron
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NORWICH
ENGLAND

THIRD ANGLE PROJECTION ALL BURRS TO BE REMOVED	DRAWN B.S.JACKSON.	DATE 13AUG.91.	DIMENSIONS IN MILLIMETRES	TOLERANCES DECIMAL TO 2 PLACES ±.1mm DECIMAL TO 1 PLACE ±.2mm WHOLE DIMENSIONS ±.4mm ANGULAR ± ½° UNLESS OTHERWISE STATED	MATERIAL ——	ASSY DRG & PARTS LIST CIRCUIT DIAGRAM CHECK PROCEDURE CHECK LIST	TITLE ASSY FINISHED WB 4922
	CHECKED A.D.	DATE 17.2.92	SCALE ——		FINISH ——		DRAWING No. DA401076
	APPR RJH	DATE 17-2-92	NOT TO BE SCALED				SHEET 1 OF 1

BW PDS 831961