

Folder 4920 Am (G-4920M) in SE30 H.D. 21/12/92 (1/12/92 - W.P.)

Files W4 M 4920 1.1 (Am) (Tuds) on White Handout paper  
and pages 1, 2, 9, 13 + 14 from P4 M 4920 1.1 (Am) Reduced.

January 1993

Dear Customer

You will find with your Model 4920 AC Voltage Measurement Standard (AVMS) a copy of the User's Handbook and a Quick Reference Guide. A list of optional accessories appears on page 1-4, included in this listing are the Servicing Handbooks (Maintenance and Reference).

Unfortunately these are subject to review and printing delays, and will not be available for some months. Therefore in order to expedite the shipment of your order, which included the Servicing Handbooks, we enclose copies of the Servicing Handbooks for the similar Model 4920M AVMS.

Also enclosed are five pages (1-2/3, 1-9 and 1-13/14), which should replace the existing pages of the 4920M Volume 1, as they reflect the most important changes (differences) between a 4920 and a 4920M.

Please accept our apologies for any inconvenience caused, the correct handbooks will be forwarded to you as soon as they become available. I hope that the performance of the 4920 AVMS meets your needs and expectations. If you have any comments, criticisms or questions, please do not hesitate to contact me at the above address.

Your sincerely

B. Edward Foster  
Sales Support Manager.

## 1.4 Special Calibration (Contd.)

### 1.4.1 Entry into the SPCL Menu

#### CAL Group of Menus

A description of the User Interface is given in Section 3 of the User's Handbook for the main functions. If you are unfamiliar with the front panel controls, you should complete the quick tour which starts on Page 3-5.

To give an overall view, movement among the SPCL group of menus is described by the diagram on the opposite page.

#### Access to Special Calibration

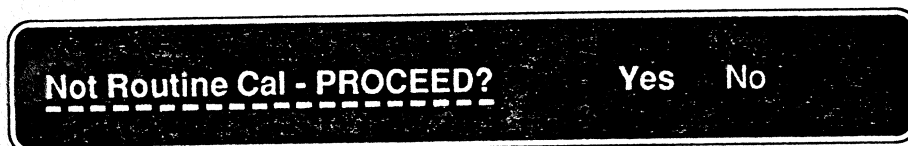
To carry out any of the special calibrations it is first necessary to enter the SPCL menu via the CAL menu. The CAL menu is protected, and once active, the Caltrig key is enabled. For these reasons, users are referred to the 'Preparation' procedure detailed on page 8-5 of the User's handbook. Further details of the calibration facilities are described in Section 4 of the User's Handbook, beginning on page 4-20; the CAL menu description starts on page 4-21.

#### The CAL Menu



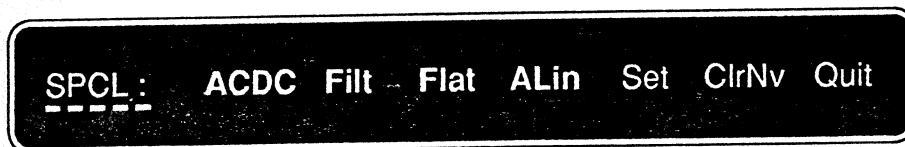
Once the CAL menu is active, pressing the Spcl soft key transfers via a warning 'Check' menu.

#### Check Menu



Pressing the Yes soft key transfers directly to the SPCL menu.

#### The SPCL Menu



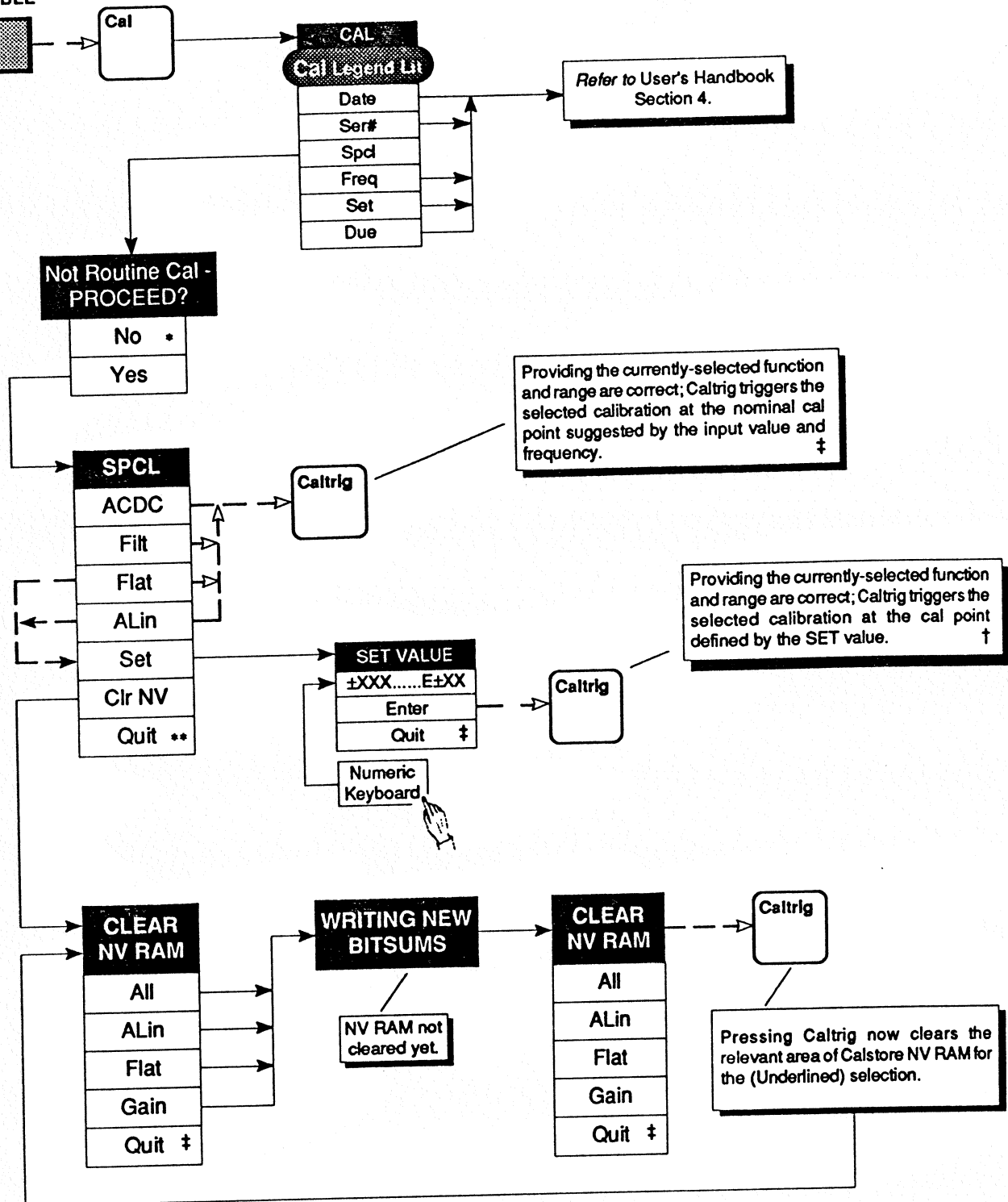
The special calibrations highlighted in the above menu diagram are described in the following sub-sections 1.4.2 to 1.4.5.

ACDC calibration is dealt with in Sub-section 1.4.7.

Sub-section 1.4.6 deals with clearance of the non-volatile RAM calibration memory.

## SPCL Group of Menus - Overall View

Rear Panel  
CALIBRATION switch  
to 'ENABLE'



\* = Reverts to CAL menu.  
 ‡ = Reverts to SPCL menu.  
 † = Escape via any front panel menu key.

### 1.4.5 ACV Linearity Calibration - 'ALin' Key

To calibrate all ACV ranges' linearities using a calibration in either the 10V range.

Note that the procedure is written for recommended voltages and frequencies.

The alternative voltages and frequencies are shown in Table 1.4.2, below.

#### Linearity Calibration at the Upper Calibration Point

1. Connect the DC Voltage Calibrator into the calibration setup as shown in Figure 1.4.3.
2. On the 4920M, select ACV function and the 10V range. Press the Cal key and select Spcl. From the SPCL menu, select the ALin option.
3. Configure a Thermal Voltage Converter for 10V.
4. Set the output of the DC Calibrator to 10V, and turn its output on.
5. Allow the Thermal Voltage Converter to settle.
6. Adjust the DC Nanovolt Source to achieve a null on the DC Nanovoltmeter.
7. Reverse the polarity of the DC Calibrator output. Allow the Thermal Voltage Converter to settle, and note the DC reversal error on the DC Nanovoltmeter. Adjust the Nanovolt Source until the Nanovoltmeter shows half of the DC reversal error.
8. Turn the output of the DC Calibrator off and disconnect it by splitting the two precision N-series tees.
9. Connect the AC Voltage Source in place of the DC Voltage Calibrator. (Note: if the DC Calibrator and AC Voltage Source are combined into a single unit, the output of this unit can simply be switched from DC to AC.)
10. Set the AC Source to 10V RMS at 1MHz, and turn its output on.
11. Increment or decrement the output voltage of the AC Source to achieve a null on the DC Nanovoltmeter. Allow the Thermal Voltage Converter to settle. Then, if necessary, readjust the output voltage of the AC Source for null.
12. Select the SET option and enter a value which is equal to the calibration voltage used in operation (4), incremented or decremented by the AC-DC difference correction of the Thermal Voltage Converter at the calibration voltage and frequency.
13. Execute ALin calibration at the Upper calibration point by pressing the 4920M Caltrig key.

#### Linearity Calibration at the Lower Calibration Point \* †

14. Repeat operations (3) to (13) for 2.0V at 1MHz.

#### ACV Linearity Calibration \*

Table 1.4.2 Upper and Lower Calibration Points - Permissible Voltages and Frequencies

Range	Upper Cal Point: Uc		Lower Cal Point: Lc	
	Recommended	Voltage Limits	Recommended	Voltage Limits
10V	10.0V	$5.0V \leq U_c < 12V$	2.0V	$0.3V \leq L_c < 5V$

#### All Calibration Points - Permissible Frequency Fc:

Recommended: 1MHz      Limits:  $980kHz \leq F_c \leq 1.02MHz$

\* = Version 1.12 and Previous Firmware

† = Version 1.13 and Later Firmware have Mid Cal Point Mc:  $U_c = 10.0V$ ,  $M_c = 3.00V$ ,  $L_c = 1.00V$

## 1.4.6 Clear the Non-Volatile RAM Calibration Memory - 'ClrNV' Key

To clear all or part of the calibration memory

### Caution!

This command can obliterate the results of an expensive original calibration or recalibration!

### Note

For firmware version 1.16 and earlier, it is recommended that the calibration stores are cleared prior to Special Calibration Operations. All Special Calibrations must then be performed.

### Extent of Clear

The extent of clear is defined by programming the following options:

- |             |  |
|-------------|--|
| <b>All</b>  | clears all non-volatile calibration memory <i>except</i> user-entered data.<br>The calibration interval is reset to 180 days,<br>The internal calendar/clock is reset to 121281. |
| <b>ALin</b> | Clears the section of non-volatile calibration memory which contains corrections to ACV linearity.   |
| <b>Flat</b> | Clears the section of non-volatile calibration memory which contains corrections to flatness.  |
| <b>Gain</b> | Clears the section of non-volatile calibration memory which contains corrections to range gain.  |

### ROM Checksums

ROM checksums are recalculated and written to calibration memory when any Clear NV RAM command is executed.

### Special Calibration following Memory Corruption

(e.g. When the battery which supplies the non-volatile calibration memory has been changed with the power off - see Section 4)

Section 2 (Fault Diagnosis) describes the device-dependent error codes resulting from internal tests. Error codes which are generated for calibration memory faults are listed in Section 2.

Some of these refer to individual calibration correction errors, and others to combined errors.

When faced with any of these error codes, please seek advice or assistance from your nearest Datron Service Center.

When it is deemed necessary to carry out special calibration as a result of non-volatile memory corruption, the starting point should be to clear the relevant calibration memory before proceeding with other individual calibrations.

### Clearance Procedure

Selecting Clr NV in the SPCL menu transfers to the CLEAR NV RAM menu which offers a choice of clearing one or all of four sections of RAM. The selection should be chosen as a result of consultation with technical staff at the service center.

When the selection is made by pressing the relevant soft menu key, the processor calculates and writes new bitsums. No NV RAM is cleared during this operation; the dot-matrix display merely shows the words **WRITING NEW BITSUMS**.

When the CLEAR NV RAM menu is restored, the selected (underlined) Calstore NV RAM can be irrevocably cleared by pressing the Caltrig key.

## 1.4.7 ACDC Calibration

1. Connect the DC Voltage Calibrator to the 4920 ACV input.
2. On the 4920, select ACV function and the 10V range.
3. Set the Calibrator to 10VDC.
4. On the 4920:  
Press the Cal key and select Spcl.  
From the SPCL menu, select the ACDC option.
5. Turn the output of the DC Calibrator output on, +ve polarity.
6. Allow the 4920 reading to settle.
7. Press Caltrig.
8. Turn the output of the DC Calibrator output on, -ve polarity.
9. Allow the 4920 reading to settle.
10. Press Caltrig.
11. Set the Calibrator to 3VDC.
12. Repeat steps (5) to (10).