

PCB 75045

22.1 Introduction

The user configurable filter is designed to allow special filter requirements to be easily fitted to the MJS401D Measurement System.

The sub-board assembly consists of an input buffer LF356, a quad op amp LF347, power supply decoupling, and connectors for mating with the Option Filter Motherboard.

The rest of the PCB is laid out in breadboard or stripboard style, with locations for a gain adjustment preset, and a general use preset.

Many types of circuits may be configured on this card.

22.2 Circuit Description

The following are the system interface requirements.

22.2.1 Gain

Nominally unity.

22.2.2 Input characteristics

Input impedance nominally infinite. The filter is fed from a source of 0 to a few hundred ohms and is always provided with a DC path by its source. The simplest and best way is to feed into the non-inverting input of the LF356, with no other components on this point. A bias resistor is of no help whatsoever; it only introduces a gain error, dependent on the source impedance, which is in turn dependent on the number of filters before this one.

Don't try to put a passive filter direct at the input!

22.2.3 Output characteristics

Output impedance nominally 0. Should always provide a DC path, biased at about 0 mV, for following circuitry. Must be capable of driving up to 100 pF without instability or alteration of the frequency response.

22.2.4 Operating level

The signal level at the filter input is -10 dBu for readings of 0 on the front panel meter.

22.2.5 Headroom

The nominal clipping point of following circuitry is equivalent to +13 dBu at the filter output for AVG, RMS and PPM rectifiers; +23 dBu for the quasi-peak rectifier. If using an equal-value Sallen and Key filter, or any other type with inherent gain which must be compensated for by attenuation elsewhere, we recommend that the attenuation is placed immediately after the input buffer.

See Fig. 22.2.1 for the PCB layout.

See Sections 4 (BP/LP), 5 (CCIR/HP), 19 ("A, B, C" Weighting), 20 (80 kHz Low Pass), and 21 (IBA Crosstalk Weighting Filter) of this manual for the approach taken when designing the fixed filters for the MJS401D. This may well be a useful source of ideas and information. Also see Section 18 (Option Filter Motherboard), on which this filter is to be mounted.

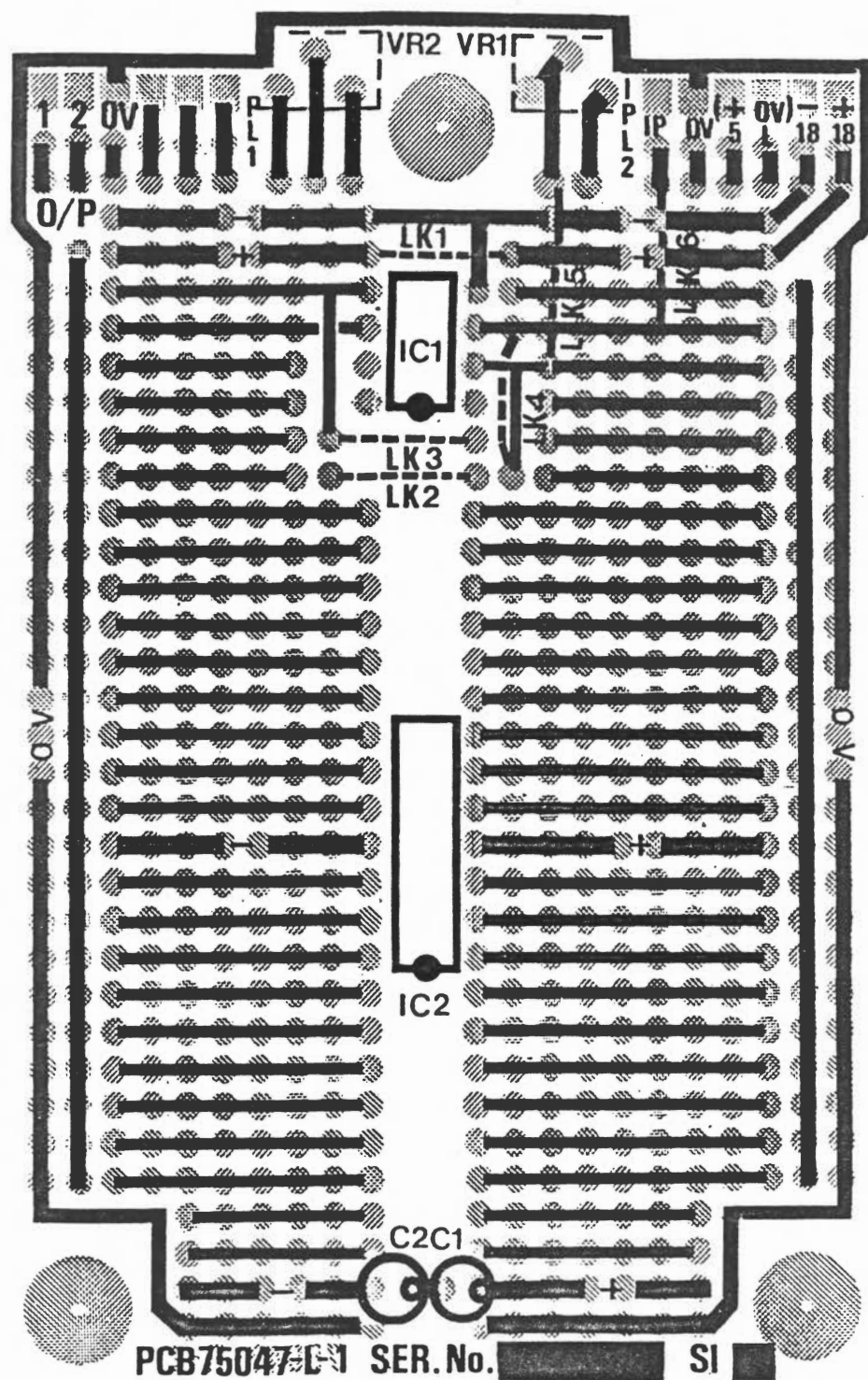


Figure 22.2.1 User Configurable Filter - PCB Layout

22.3 Removal/Replacement

The User Configurable Filter is fitted to the Option Filter Motherboard. See Section 18.

22.4 Fault Finding

Use extender card PCB 75032.

Logic fault finding is covered in Section 18.

If the User Configurable Filter characteristic seems out of tolerance, perform the following procedure:

DESELECT ALL OTHER FILTERS EXCEPT THE User Configurable Filter.

FIRST CHECK PROPER INSTALLATION OF THE LINKS.

Check the response at PL2/1 on the User Configurable Filter sub board. It should be essentially flat. If not, check sub-systems upstream from the User Configurable Filter.

Check the response at PL1/1 on the User Configurable Filter sub board for conformity to your design. If there is an error it is in the User Configurable Filter sub board.

If no error is found, the fault is downstream from the User Configurable Filter.

22.5 Calibration

Calibration information is specific to the user's design. No information can be given here.

22.6 Installation

Requires OPTION FILTER MOTHERBOARD.

Turn off the MJS401D power switch and remove the mains lead.

In general the User Configurable Filter can be used on either OPTION A or OPTION B. Install the sub-board on the Option Filter Motherboard in position 1 to activate by the OPTION A button, or in position 2 to activate by the OPTION B button. However if no other option filter PCB is fitted, this PCB must be fitted in position 1 to be activated by OPTION A button.

If an "A, B, C" filter is also installed, remember that only one weighting should be active. Check that only link 1 is fitted ON THE "A, B, C" CARD.

If two option filter PCBs are fitted, cut link 3 on the Option Filter Motherboard.

Mate the User Configurable Filter sub-board socket connectors to the Option Filter Motherboard pin headers in the required position. Fit shakeproof washers over the screw threads. Apply a drop of low strength thread locking compound, e.g. Bostik T22, and secure using the M3 nuts provided. Tighten using a 5.5 mm A/F nut driver.

Remove the 4 screws securing the test set top cover and remove the cover. Locate the main card frame in the centre of the instrument. With the MJS401D facing you the option filter slot is 9th from the left. Using a sharp pair of wire cutters, clip out the link on the test set main motherboard which is marked "IF NO SPARE FILTER LINK" near the rear connector. Temporarily remove the BP/LP filter card if required. Insert the Option Filter Motherboard with the components facing left, and push down until it snaps into place.

Replace the cover.

22.7 Check-out

Turn on the MJS401D power. Connect a jumper lead between the oscillator output socket (or external oscillator) and the MJS401D "A" input socket.

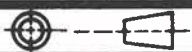
Select input "A".

Confirm the system response with the filters all OFF and in LEVEL function as essentially flat by sweeping the oscillator through the measuring system.

Select the required filter option and confirm the response according to your design. Start all measurements at the "0" reference on the meter at 1 kHz. Do not raise the oscillator level by more than 20 dB to measure the filter frequency response as this can overload the instrument inputs when the test system is driven more than 23 dB above the "0" reference level.

If the response seems wrong check out the installation procedure again. Make sure that the correct main motherboard link is cut. Also check the sub-board and option filter motherboard links again.

PROJECTION

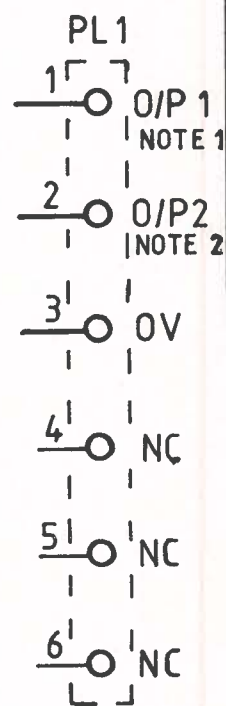
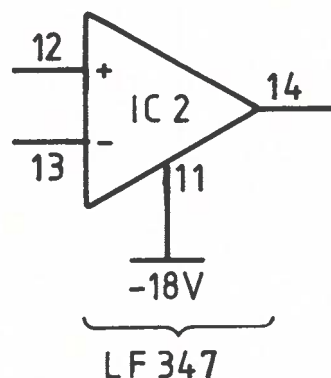
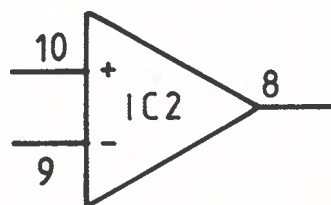
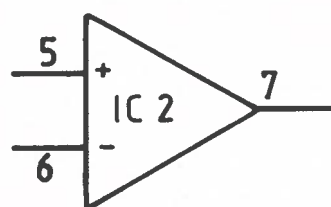
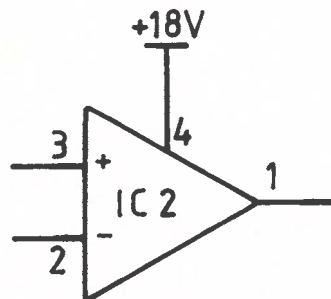


DO NOT SCALE

IF IN DOUBT ASK

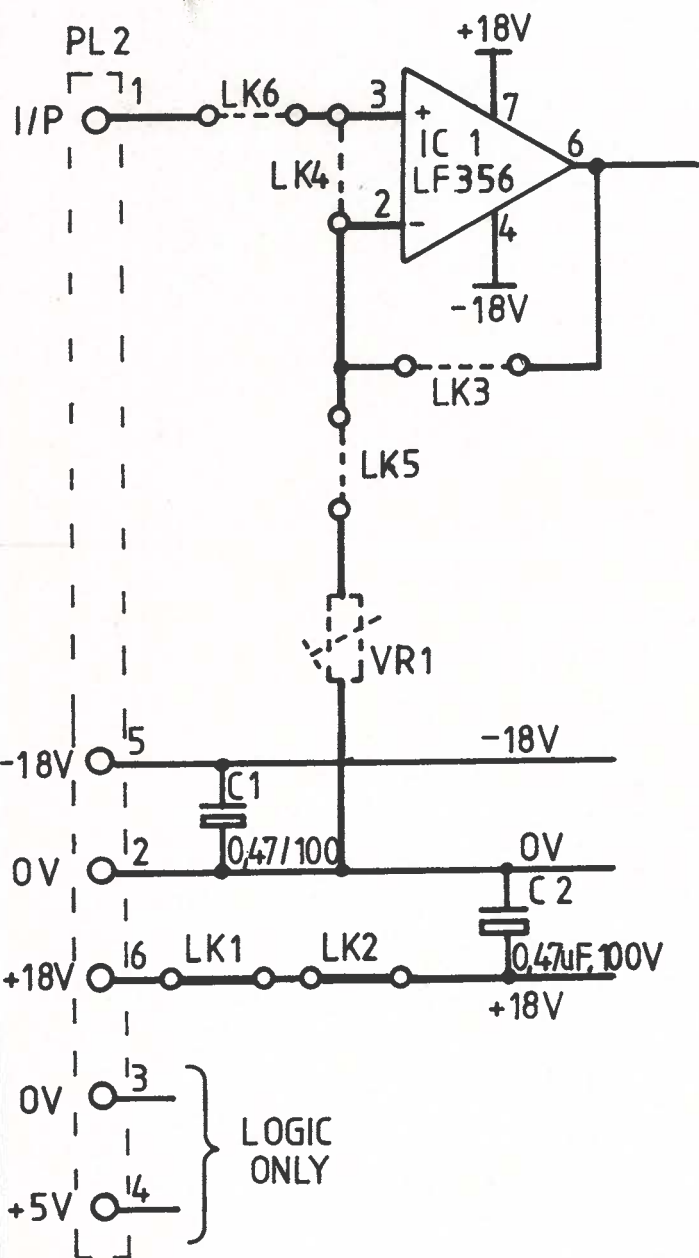
VR1 & VR2 ALTERNATIVES

SPECTROL	63X
BOURNES	3386X
BECKMAN	72X
ALLEN BRADLEY	E SERIES
CITEC	406 V



NOTE 1 -
NORMAL O/P

NOTE 2 -
USE ONLY IF USER FILTER
HAS 2 SEPARATE OUTPUTS.
THEN ONLY ONE OPTION
FILTER MAY BE INSTALLED
ON FIL14 MOTHERBOARD &
MUST BE IN POSITION
LABELLED "ABC FILTER
THIS SIDE ONLY"



LINK 1 & 2 ARE FITTED

TO CUSTOMERS REQUIREMENTS



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TITLE

CIRCUIT DIA. SCRATCHPAD
CUSTOM FILTER BREADBOARD
PCB 75047

REVISION

NO	DATE	CHANGE	APPROVED
1	14.10.85	FI AN0151	J.D. Hyatt
2	29.1.86	AN 0214	J.D. Hyatt

TOLERANCES - UNLESS OTHERWISE STATED

USE MJS401 D OPTION
FILTER MOTHERBOARD

MATERIAL see
750/M/452/4

ORIGINAL SCALE 2-1

DRAWN TONY SMYTHE

DATE 14-10-85

CHECKED *W. S. Mythe*

DATE 14-10-85

DRAWING No.

REV

PROJECT NO TYPE SHEET NO SIZE

750

C

454

3

2

FINISH