

## Telequipment V2 Amplifier Module

The purpose of this document is to show the similarities between the rare V2 and common V4 amplifier modules. The reason this project was undertaken is the complete lack of technical data for the V2. In conjunction with a V4 technical manual the information provided should be adequate to repair and calibrate a V2 module.

All comparisons were made between V4 manual issue 3 and V2 module serial number 540104.

### PCBs

Both modules have 3 PCBs as follows;

	Attenuator	Amplifier	Trigger
V2	PC137	PC130	PC131
V4	PC137	PC152	PC153

One thing that is evident from visual inspection is the similarity of layout between the two sets of boards. Even the component numbers, for the most part, match.

The main differences are;

### PC131/PC153.

PC131 has a number of extra components fitted. These are to drive the CH1 output socket on the front panel. Inspection of the PC153 shows that it has the same holes drilled but not populated. I suspect it was not implemented on the V4 as there is no room on the front panel to fit the BNC socket.

The output is 50mV/DIV.

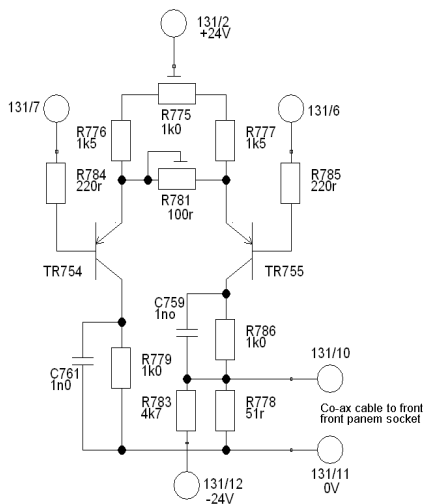


Fig 1 CH1 output schematic

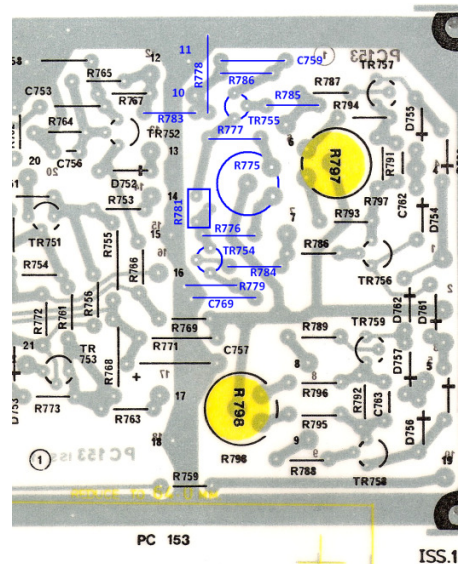


Fig 2 PCB layout of added components

### Parts list

Cir Ref	Value	Type	Tol	Note
C759	1n0	PS		
C761	1n0	PS		
R775	1k0	Preset	20%	
R776	1k5	C	5%	
R777	1k5	C	5%	
R778	51R	C	5%	
R779	1k0	C	5%	
R781	100R	Preset	20%	Ceramic bodied vertical format.
R783	4k7	C	5%	
R784	220R	C	5%	
R785	220R	C	5%	
R786	1k0	C	5%	
TR753	2N2369	SI	NPN	Fitted to both PC131 & PC153. Omitted from parts list.
TR754	MPS6518	SI	PNP	
TR755	MPS6519	SI	PNP	

PC130/PC152.

PC130. The X5 gain function is not implemented. The PCB is not tracked for the extra components.

R703 & 704 are not fitted. The calibration procedure has been amended accordingly

PC152. TR601-TR607 are 4 dual semi-conductors. PC130 has 8 individual devices.

There are 4 extra decoupling capacitors (C619-623) they are not tracked in on PC130.

Cir Refs		Value	Type	Tol	Note
PC152	PC130				
R612	R612	5k1	C	5%	
R613	R613	5k1	C	5%	
R615	R615	5k1	C	5%	
R616	R616	5k1	C	5%	
R617	R617	47R	C	5%	
R618	R618	47R	C	5%	
R619	R619	100R	C	5%	
R631	R631	5k1	C	5%	
R688	R688	1k0	Preset	20%	The corresponding CH1 component(R689) is 220R
R698	Not fitted				
R699	Not fitted				
R701	Not fitted				
R702	Not fitted				
R703	Not fitted				
R704	Not fitted				
R705	Not fitted				
R706	Not fitted				
TR601A	TR601	WD212	FET	N-CH	Heatsinked to TR602
TR601B	TR602	WD212	FET	N-CH	Heatsinked to TR601

TR603A	TR603	WD212	FET	N-CH	Heatsinked to TR604
TR603B	TR604	WD212	FET	N-CH	Heatsinked to TR603
TR605A	TR605	2N2369	SI	NPN	
TR605B	TR606	2N2369	SI	NPN	
TR607A	TR607	2N2369	SI	NPN	
TR607B	TR608	2N2369	SI	NPN	
TH601	Not fitted				
TH602	Not fitted				
S602	Not fitted				
S603	Not fitted				
C605	C605	10n	PE	20%	
C606	C606	10n	PE	20%	
C607	C607	10n	CE		
C608	C608	10n	PE	20%	
C619	Not fitted				
C621	Not fitted				
C622	Not fitted				
C623	Not fitted				

### **Calibration Procedure.**

V2 may be able to be calibrated using the V4 procedure but without knowing the bandwidth etc of the V2 it is not possible to be certain. Other differences are detailed below.

#### Section 4.4.2

Ignore subsections 1.0, 2.0, 3.0 and 4.0.

#### Add new section 4.4.5

Before carrying out this procedure ensure that the mainframe's trace centring adjustments are correctly set.

1.0 Check CH1 analogue output.

1.1 Using the vertical shift control move the trace to the centre of the screen.

1.2 Connect a high impedance volt meter to the front panel analogue output.

1.3 Adjust R775 for a reading of 0mV.

1.4 Move the trace to the top line of the graticule.

1.5 Adjust R781 for a reading of 200mV(50mV/div)

1.6 Repeat steps 1.0 to 1.5 to ensure full calibration.