



## SERVICE TOOLS

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## 13.0 SERVICE TOOLS

### 13.1 RECOMMENDED TEST AND CALIBRATION EQUIPMENT

A complete list of all material necessary for the adjusting procedure and the performance check is given in section 9.2.

### 13.2 DUMMY LOAD FOR POWER SUPPLY (unit A20)

Information for an easy access to the power supply and for safe working conditions can be found in chapter 10 "DISASSEMBLING AND ASSEMBLING". This chapter also explains how to measure the power supplies in working condition.

The position of the rear side panel of the oscilloscope under test is also indicated in chapter 10.

In order to be able to determine whether a certain fault condition is initiated by the power supply itself or by the connected oscilloscope circuits, a dummy load is listed in the table below. The table gives also an example of the resistor types that can be used to compose the dummy load: the resistors can be ordered at Concern Service.

The dummy load resistors must be mounted on a p.c.b. and connected via a (flat)cable to X4604 on unit A20 (mounted on rear side panel). The connector pins are also given in the diagram of chapter 8.20. Electrolytic capacitors in the dummy load are not necessary because of the capacitive values present on the power supply unit itself.

Supply Voltage	Connector pin(s) X4604 (A20)	Output Current	Power dissipation	Dummy load
+5 V (+5 D)	30A-30C-31A-31C-32A-32C	5 A	25W	10 resistors of 10 Ohm, 4 W in parallel: 4822 112 21054
-5 V (-5 D)	13A-13C-14A-14C-15A-15C	2,2 A	11 W	4 resistors of 10 Ohm, 4 W: 4822 112 21054 and 1 resistor of 39 Ohm, 4 W: 4822 112 21069 in parallel
+7 V	16A-16C	550 mA	3,9 W	2 resistors of 27 Ohm, 4 W: 4822 112 21065 in parallel
-7 V	17A-17C	1,2A	8,4 W	2 resistors of 12 Ohm, 7 W: 4822 112 41056 in parallel
+14 V	20A-20C-21A-21C	1,2A	16,8 W	2 resistors of 27 Ohm, 11 W: 4822 112 31065 and 1 resistor of 100 Ohm 4 W: 4822 112 21081 in parallel
-14 V	18A-18C-19A-19C	1A	14 W	2 resistors of 8,2 Ohm, 4 W: 4822 112 21052 in parallel, with 1 resistor of 10 Ohm 11 W: 4822 112 31054 in series
+19 V	23A-23C	150 mA	2,9 W	1 resistor of 100 Ohm, 4 W: 4822 112 21081 in series with 27 Ohm , 4 W: 4822 112 21065
-19 V	22A-22C	250 mA	4,8 W	2 resistors of 150 Ohm, 4 W: 4822 112 21085 in parallel
+40 V	24A-24C	120 mA	4,8 W	1 resistor of 330 Ohm, 7 W: 4822 112 41094
+100 V	12 A	20 mA	2 W	1 resistor of 4,7 kOhm, 4 W: 4822 112 21125
⚡ 6,3 V a.c filament C.R.T.	X4602 pins 3 and 1	250 mA	1,6 W	lamp 6,3 V 250 mA: 4822 134 40007

### 13.3 SPECIAL TOOLS

#### 13.3.1 Special tool for removal of N and BNC input connectors

A special tool is available for removal of the nuts that secure the N and BNC input connectors (service ordering code 5322 395 54023). For those who want to make such a tool, a sketch is given with dimensions in mm in figure 13.1. The material is silversteel N094, tempered 40-45 RC.

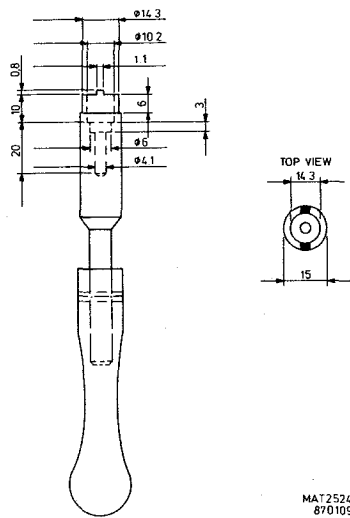


Figure 13.1 Dimensional drawing of tool for BNC input sockets.

#### 13.3.2 Special tool for removing the small rotary knobs of the front panel.

A special tool is available for removing and fixing the small knobs, ordering number 5322 395 54024.

This can also be done with a normal screwdriver as described in chapter 10.

For those who want to make such a tool, a sketch is given below with the dimensions in mm.

The material is silversteel N094, tempered 40-45RC.

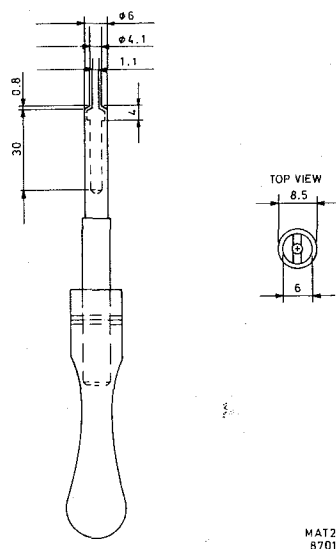


Figure 13.2 Dimensional drawing of tool for slotted nut.

### 13.3.3 Extension board for the units A1 ... A11 and A20

For test and repair purposes the unit A1 ... A11 or A20 can be plugged in their connectors via an extension board available under codenumber 5322 216 51153

The position of the rear side panel with unit A20 connected to the distribution unit A53 via the above mentioned extension card is indicated in chapter 10.

### 13.3.4 Special tool for removing integrated circuits (DIL package)

For cutting the connection pins of integrated circuits a special cutnipper is available under ordering number 5322 395 71004

## 13.4 TRIMMING KIT SBC 317 4822 310 50095

The SBC 317 Trimming Kit matches every current trimming requirement on all products. The set contains 27 pieces (22 different bits, plus 3 bit holders and 2 extension pieces). The insulated holders and extension pieces make it easy to reach into a chassis and make accurate adjustments, without wasting time or risking shocks. The SBC 317 Trimming Kit is packed in a flat transparent case. Several of the most commonly required bits are duplicated. In addition, a spare set of 8 bits is separately available as replacement (4822 310 50016).

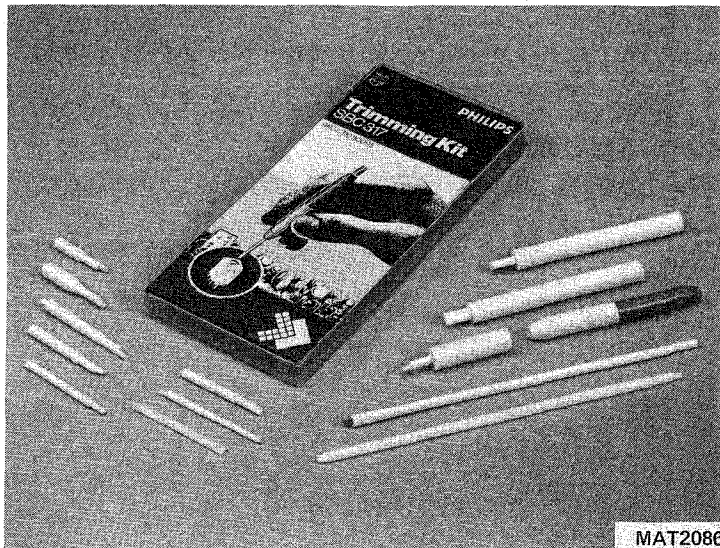


Figure 13.3 Trimming tool kit.