

SUGGESTED POWER SUPPLY CIRCUITS

for the

TM 500 BLANK PLUG-IN KIT

1 WIDE (040-0652-XX)

2 WIDE (040-074-XX)

SECTION B Circuit Selector Guide

Supply Use:	Desired Voltage	(Sec C-1)	(Sec C-2)	(Sec C-3)	(Sec C-4)	TYPE
		3-Terminal	μ A 723C MC1723 C	Op Amp	Discrete	
Bipolar Logic	5V	01-1	10-1 10-2	20-1	30-1	P O S
Linear MOS	5 to 20 V	02-1 (A & B) 04-3	11-1 11-2	21-1 21-2	31-1	
	20 to 50 V	02-2	14-1	22-1 22-2	32-1	

Section A—General Instructions

Section B—Selector Guide

The selector guide is a matrix table which shows various voltage levels and polarities of supply, all attainable with a variety of circuit devices.

Bipolar Logic	5V	03-1	12-1	23-1	33-1	N E G
Linear MOS	5 to 20 V	04-1 (A & B) 02-3	13-1 13-2	24-1 24-2	34-1	
	20 to 50 V	04-2 02-4	14-1	25-1 25-2	35-1	

Section C—Circuit Descriptions

Each circuit description includes schematic construction notes and other pertinent information. For accommodation to various current/power levels and other common factors, refer to Section D.

Linear MOS	5 to 20 V		15-1	26-1	36-1	D U A L
	20 to 50 V			27-1	37-1	

Section D—General Construction Notes

A set of notes describing subcircuits generally applicable to many of the circuits in Section C; plus other general information applicable to most of the circuits in Section C.

NOTE

Each vertical column in the selector guide constitutes a group of circuits using related techniques. When evaluating an individual circuit, it

is a good idea to read the introduction to the subsection. Also examine any other circuits in the subsection which may be referenced.

Special supply requirements may dictate other circuits, and an almost unlimited number of designs is possible. Users should feel free to use other designs, being sure to take into account mainframe ratings as given in the kit instructions.

total number of circuits described, variations based on current/wattage levels are described in Section D.

IMPORTANT

Observe all CAUTION notes and use all applicable safety procedures in designing and constructing your power supply.

DISCLAIMER OF RESPONSIBILITY

Tektronix, Inc., shall not be responsible for any claim or loss of any nature arising directly or consequentially from the construction or use of the equipment constructed from these materials.

SECTION A

(1) General Instructions

Users of TM 500 blank plug-in kits will find that most power supply requirements can be met by using one or more of the circuits described here. They are chosen for simplicity, reliability, component availability, and moderate cost.

(2) Major/Minor Power Requirements

An important step in supply design is to determine the number of regulated voltages required and the amount of current each must deliver. Each compartment in a mainframe gives access to two series-pass transistors (one npn and one pnp) capable of major-supply current and wattage. If more than two supplies are needed, the major supplies should be designed to use the mainframe transistors; the minor supplies will need their own pass devices in the plug-in.

(3) Selector Guide

The next section of this application note will aid in the selection of circuits. There are tables for positive, negative, and dual supplies. Each table refers you to an appropriate circuit based on (1) voltage level, and (2) type of devices preferred or available. Most of the circuits are capable of a wide range of current/wattage levels depending on the type of pass device and the method of heat sinking. To reduce the

SECTION C

C-1: 3-Terminal IC Regulators

General

A number of semiconductor manufacturers offer families of 3-terminal ic devices that require only raw or preregulated dc input voltage to form a complete regulated supply. Typically, these circuits include a reference voltage and amplifier, an error amplifier, an output power (pass) transistor, and current-limit and overtemperature circuits. Each device has its own fixed output voltage and current limit. However, since maximum current varies with package size and heat sinking, added external components make it possible to vary output voltage, increase current capacity, or form a current source rather than a voltage source.

This application note makes reference only to simple applications with few external components. Also, it lists only a few of the more recent medium current families. By referring to manufacturer's data sheets and this note, applications of other types should be straightforward. Your main concerns with these devices will be that: