DISTRIBUTION RELIGION

THE IMAGE PROCESSOR MAY BE COPIED BY INDIVIDUALS AND NOT-FOR-PROFIT INSTITUTIONS WITHOUT CHARGE. FOR-PROFIT INSTITUTIONS WILL HAVE TO NEGOTIATE FOR PERMISSION TO COPY. I VIEW MY RESPONSIBILITY TO THE EVOLUTION OF NEW CONSCIOUSNESS HIGHER THAN MY RESPONSIBILITY TO MAKE PROFIT; I THINK CULTURE HAS TO LEARN TO USE HIGH-TEK MACHINES FOR PERSONAL AESTHETIC, RELIGIOUS, INTUITIVE, COMPREHENSIVE, EXPLORATORY GROWTH. THE DEVELOPMENT OF MACHINES LIKE THE IMAGE PROCESSOR IS PART OF THIS EVOLUTION. I AM PAID BY THE STATE, AT LEAST IN PART, TO DO AND DISEMINATE THIS INFORMATION; SO I DO.

As I am sure you (who are you) understand a work like developing and expanding the Image Processor requires much money and time. The 'U' does not have much money for evolutionary work and getting of grants are almost as much work as holding down a job. Therefore, I have the feeling that if considerable monies were to be made with a copy of the Image Processor, I would like some of it.

So, I am asking (not telling) that if considerable money were made by an individual with a copy of the Image Processor, or if a copy of the Image Processor were sold (to an individual or not-for-profit institution), I would like 20% gross profit...! Things like $100.00 honorariums should be ignored.

Of course enforcing such a request is too difficult to be bothered with. But let it be known that I consider it to be morally binding.

Much Love.

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NOTES ON THE AESTHETICS OF 'copying-an-Image Processor':

Being a 'copier' of many things, in this case the first copier of an Image Processor, I trust the following notes to find meaning to future copiers of Image Processors:

First, it's okay to copy! Believe in the process of copying as much as you can; with all your heart is a good place to start-get into it as straight and honestly as possible. Copying is as good (Ithink better from this vector-view) as any other way of getting 'there'.

The more you 'buy' the 'copying' of Sandin's encoded intelligence in the I-P, the more you will learn about man-and-machines. Don't try to make improvements; you'll make it only worse if you modify what already is best, even if it doesn't appear to be the 'best' to your minds-eye. It bothers me very much to see 'folk' laying onto Dan, suggestions of improvement (supposedly) without a thorough giving-in-to understanding of the I-P design. Please realize, that if you 'had-it' to do it you would not be building (copying) an I-P to begin with; you would have done it yourself along time ago...so get to work copying-as-usual.

Dan's evolutionary design of the I-P comes from a very high and thorough CONSCIOUS systems-design-intelligence-level. Every detail of the I-P typically connects omni-directionally in its integrity as part of an expandable adjunct (instrument) to being human at this time. You should realize that building an I-P is a PROCESS-level undertaking that is configured heirarchically with Sandin at the top-making decesions of modifying and 'making better' his ORIGINAL-PROTOTYPE. If you deviate in the process of 'copying' and then Dan makes an improvement on his I-P, you will most likely find it quite frustrating in updating your instrument due to your I-P being incompatible in detail to the original. If you get yourself in a jam, then you have to go to Dan and '$PEND' his time getting you out of it, which to his vector-view appears 'stupid' and other copiers', who copy, also see you as stupid because this page says to COPY and maybe you didn't...too, taking of Dan's time for your lack of copy-discipline slows-down and hinders all other copiers of this most beautiful expandable instrument because Dan loses time in 'creating' new modules.

So...after all this: the Art of 'copying' is a good form to try on for a year or so while you get into building your Image Processor...enjoy.

PEACE/ASCESIS(love):

Phil

BRIEF SYSTEMS LEVEL DESCRIPTION:

The IP physically is an array of a minimum of approximately 24 modules (aluminum boxes), representing approximately 40 electrical modules.

The documentation that follows is simply a discrption of how to build the aluminum boxes; the system is considerably more powerful than the sum of the boxes.

On paper a discription of how the IP works is more difficult than I am prepared to do. It is best communicated on video-tape; send me a video tape of your best stuff and I will send you a video tape on the IP.

But in brief, the Image Processor accepts signals = ±.5 volts 75 ohm including video signals. These signals (images) are distributed into (usually) a number of processing modules and then (usually) mixed out into a standard color encoder (output module). Since most of the processing modules are voltage controlable and control voltages and images are **interchangeable, fantastic combinatorial power is possible.**

The 'classic' Image Processor contains 8 adder-multipliers, 3 function generators, 3 comparators, 3 value scramblers, 4 oscillators, 3 differentiators, 9 references, 1 sync strip and camera input, 3 inputs, 1 sync generator, 1 color encoder and power supplies. These refer to electrical modules and not aluminum boxes. This constitutes a very powerful processing instrument and because of systems power level (inter-connect-ability), I recommend building approximately this much.

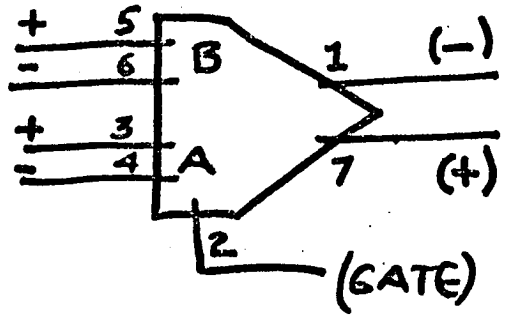
MC 1445 Gain Controlled Amplifier (multiplier):

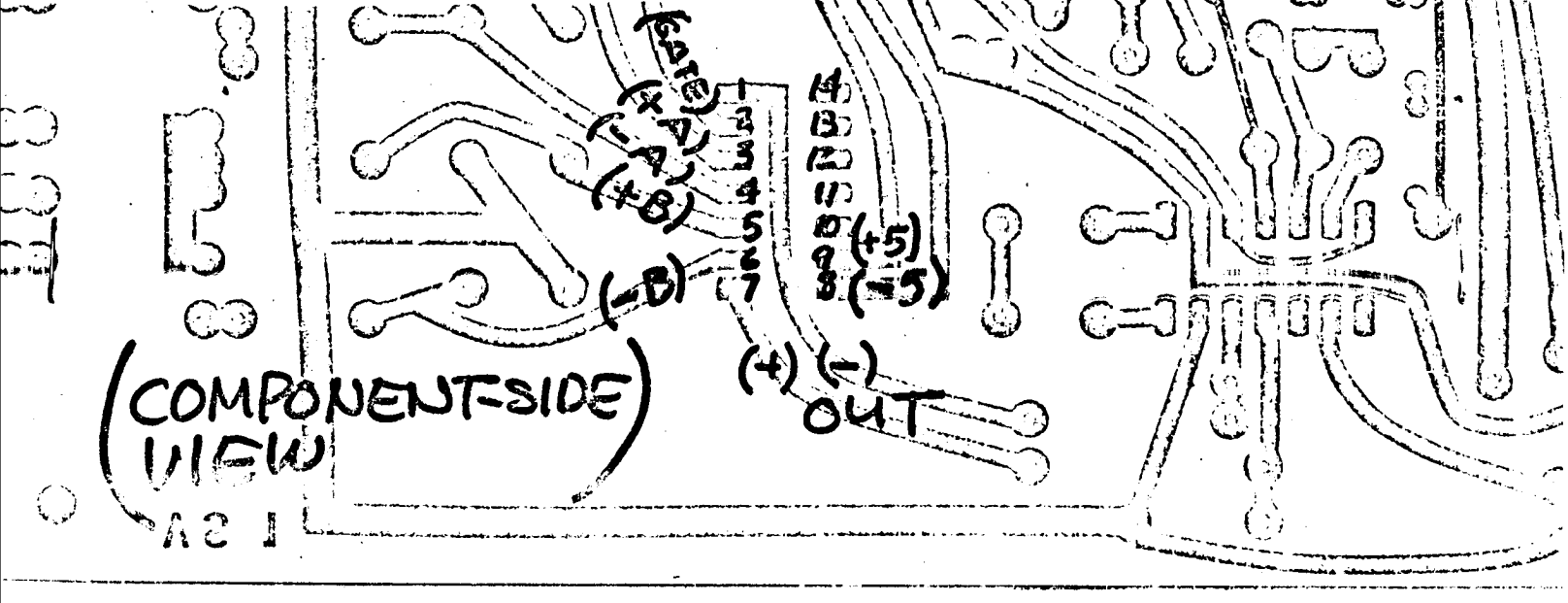
Detailed information on this integrated circuit is available from Motorola Linear Integrated Circuits Manual, available from Motorola or some Motorola distributors.

This I.C. is a four input gain controlled amplifier and is used throughout the IP. Pin (4) is the inverting input to channel A. Pin (3) is the non-inverting input to channel A. Pin (5) is the non-inverting input to channel B; pin (6) is the inverting input to channel B. Non-inverting output is available at pin (7); and the inverting output is available at pin (1).

Which input channel is connected to the output is controlled by the gate voltage at pin (2). If this voltage is high (greater than 1 volt) channel B is on; if the gate voltage is low (0 volts) channel A is connected to the output. The gate voltage produces continous control over the gains of the channels such that .5 volts causes both channel A and B to be connected to the output with 1/2 gain each. Full gain is approximately 10.

Power supply voltage (+5 volts) is connected to pin (9) and (-5 volts) is connected to pin (8). No other pins are used.



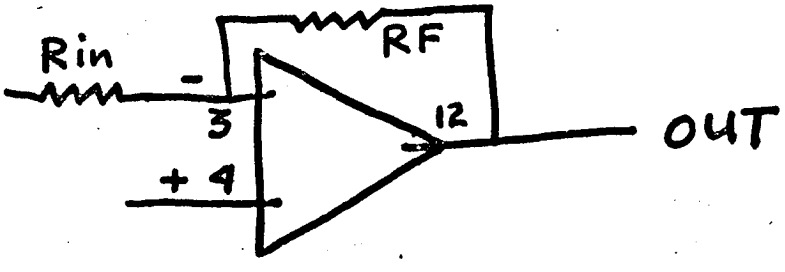


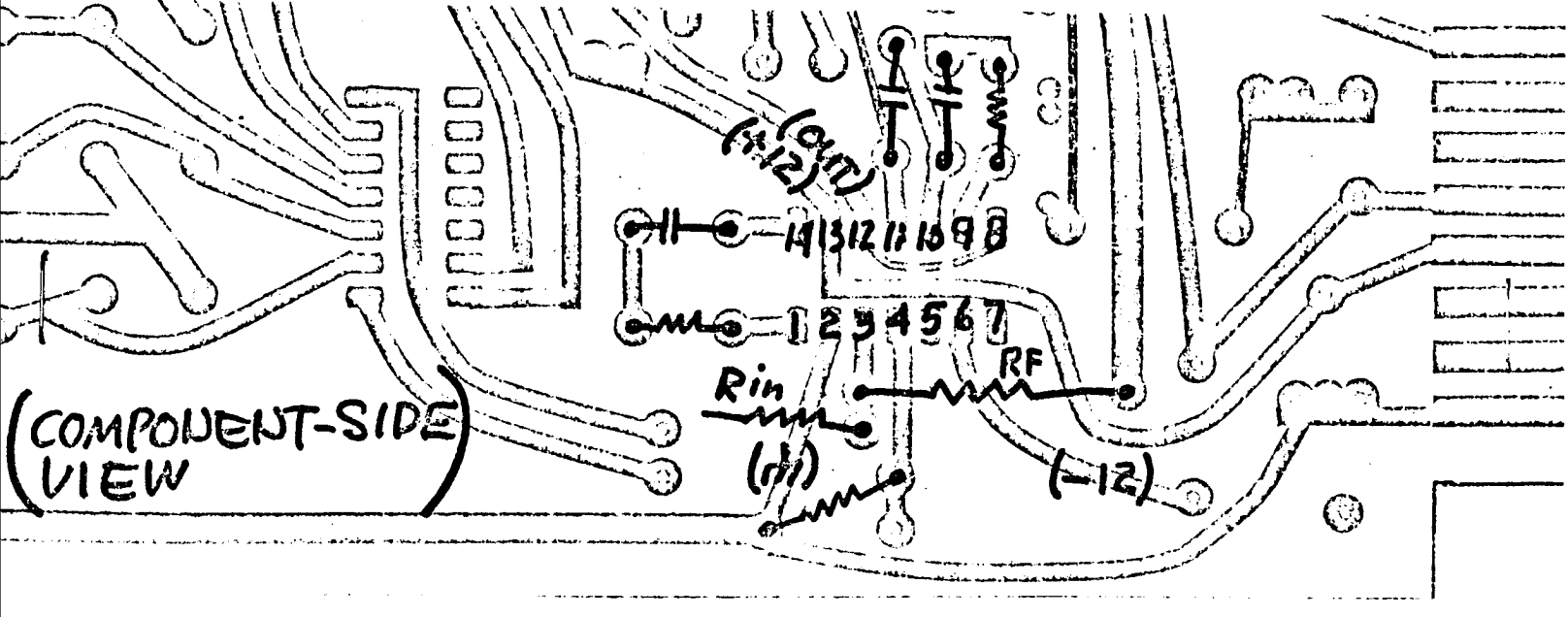
CA 3030 operational amplifier:

The CA 3030 op amp is used through out the IP. Detailed descriptions of the device are available in the RCA Linear Integrated Circuits Manuel. The book can be gotten from RCA or some distributors of RCA integrated circuits.

What follows is a brief description of the I.C.
The Op Amp has a very large gain (4000). Except in the comparator circuit, this gain is reduced by feedback of a percentage of the output signal pin (12) to the inverting input signal pin (3). A signal to be amplified is applied to pin (3) and will be inverted in the output, or it is applied to pin (4) and is not inverted. Pin (2) is grounded always. Pins (1,14,9,10,11) have to do with compensation for the amplifier which controls the tendency of the amplifier to oscillate (put out a signal of its own). The positive supply voltage (+12v.) is applied to pin (13); negative supply voltage (-12v.) is applied to pin (6). Pin (8) is sometimes connected to the output pin (12) to increase the power available from the I.C.

In simple inverting amplifier circuits, the voltage gain of the amplifier is the ratio of the feedback resistor between pin (12) and pin (3) to the input resistor connected from the input signal to pin (3).
RF/R in

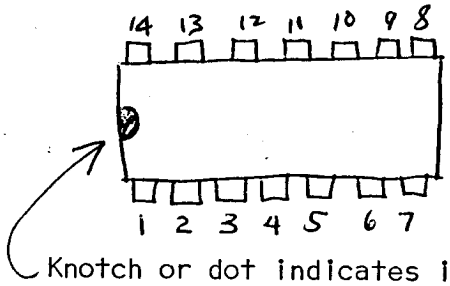




INTEGRATED CIRCUITS

Dual Inline Packages (DIP)

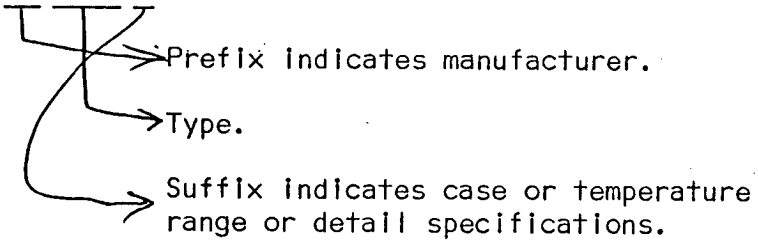
TOP VIEW:



Knotch or dot indicates installation direction.

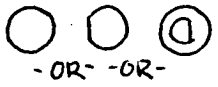
IDENTIFICATION NO. (example):

MC 1445 L



TRANSISTORS

TOP VIEW:



Physical cases will vary with the manufacturer.

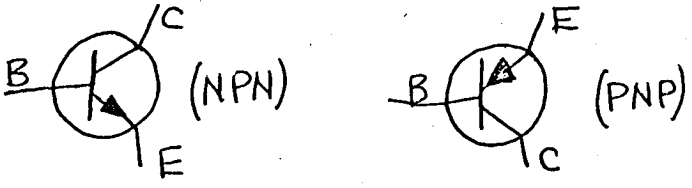
Check and match carefully the emitter, base, collector (EBC) leads with the NPN & PNP character of each transistor type.

Leads typically have to be bent for proper and convenient insertion into PC Board.

IDENTIFICATION NO.:
(only two transistors used in entire system)

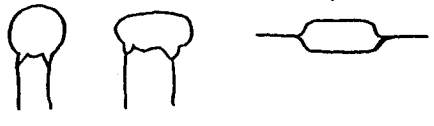
2N 4123 (NPN)
2N 4125 (PNP)

SYMBOL:



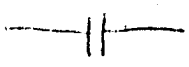
CAPACITORS

Ceramic Mica Polyestor

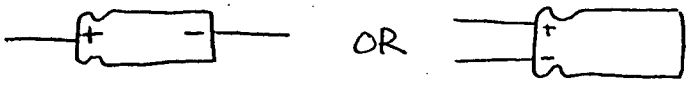


Installation direction makes no difference.

SYMBOL:

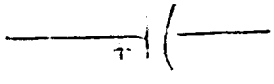


Electrolytic



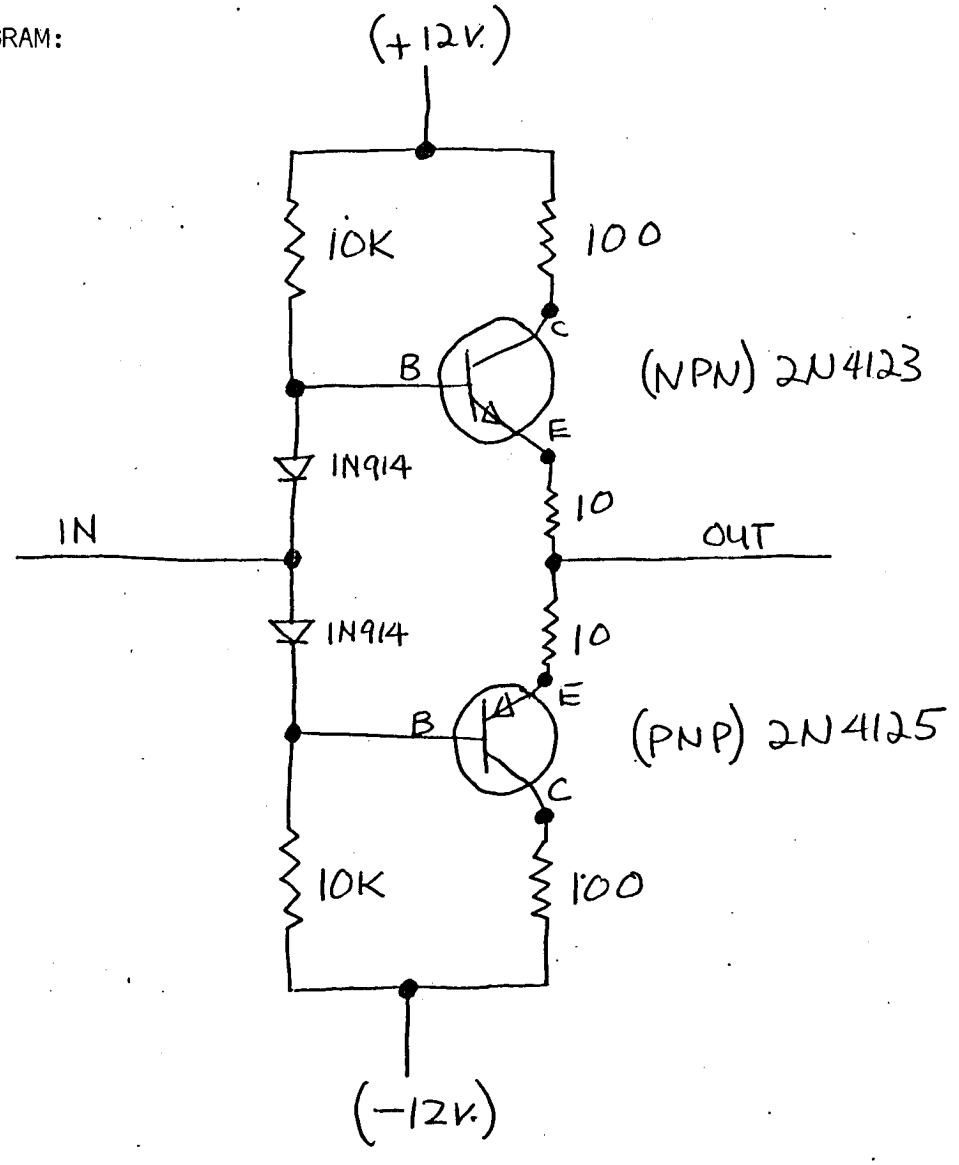
Installation must have correct (+) and (-) orientation.

SYMBOL:

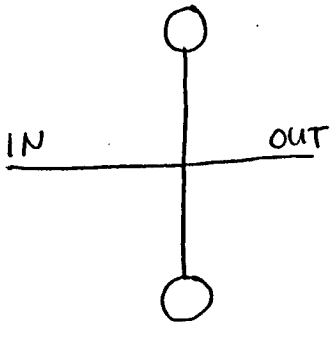


The STANDARD DRIVER is a complimentary current amplifier with voltage gain less than 1. It is used so many times in the I-P that it is abreviated:

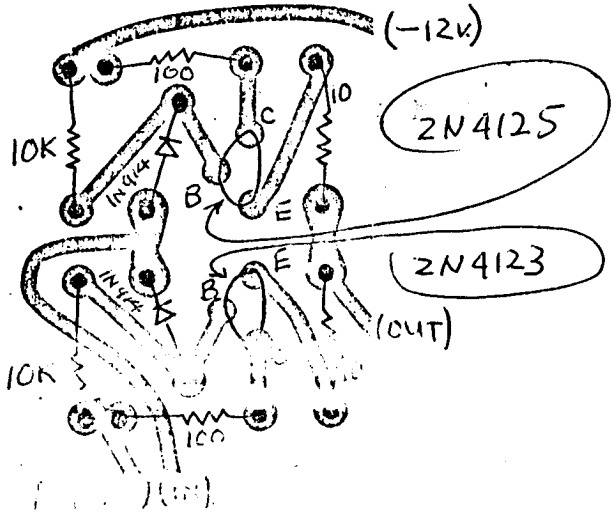
DIAGRAM:



ABREVIATION:



COMPONENT SIDE VIEW:

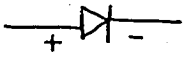


DIODES

COMPONENT:

Band or dot indicates the cathode (-).

SYMBOL:



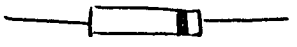
Direction of current flow is from (+) to (-).

IDENTIFICATION NO.:
(only two signal diodes used in entire system)

1N 914
1N 270

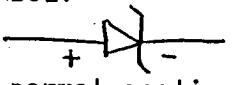
ZENER DIODES

COMPONENT:



Band or dot indicates the cathode (-).

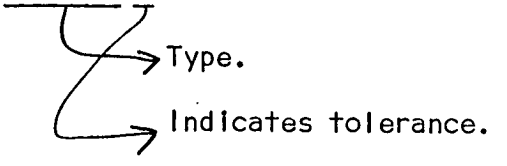
SYMBOL:



In normal application (+) supply voltage is supplied to cathode and (-) supply voltage is supplied to anode.

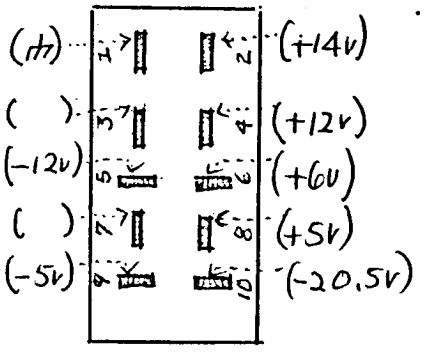
IDENTIFICATION NO. (example):

1N 5338 B

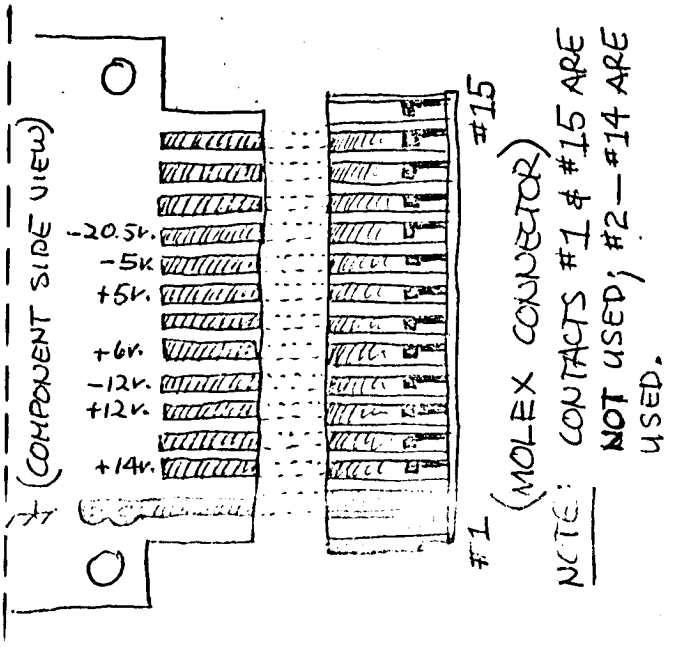


COLOR CODE FOR POWER BUSSING

BLACK (gnd)
ORANGE (+14v)
WHITE ( )
RED (+12v)
BLUE (-12v)
GREEN (+6v)
GRAY ( )
YELLOW (+5v)
VIOLET (-5v)
BROWN (-20.5v)

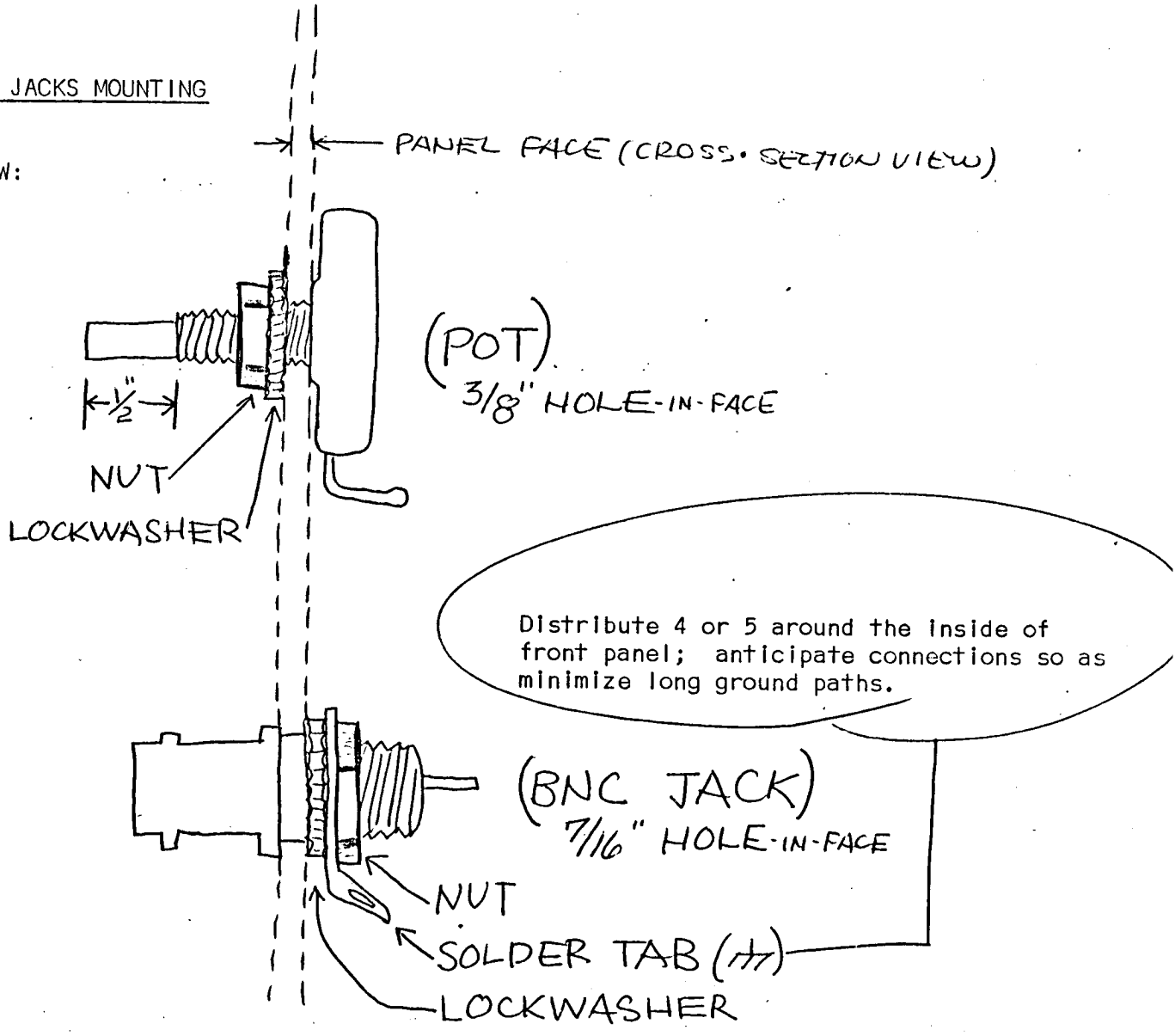


NOTE: All power supply lines into PC board are by-passed to ground (gnd) with a 50μF 25wvdc electrolytic capacitor (indicated in pictorials only).

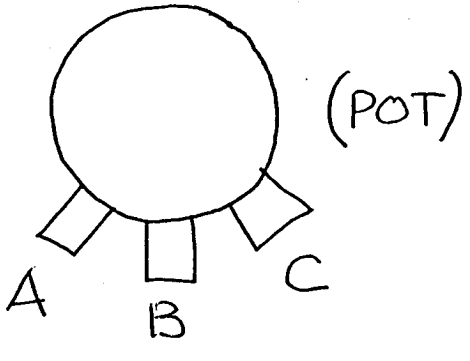


POTS and JACKS MOUNTING

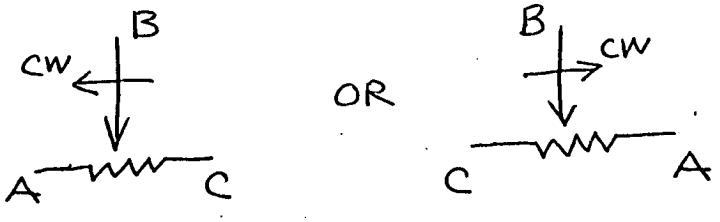
SIDE VIEW:



BACK VIEW:

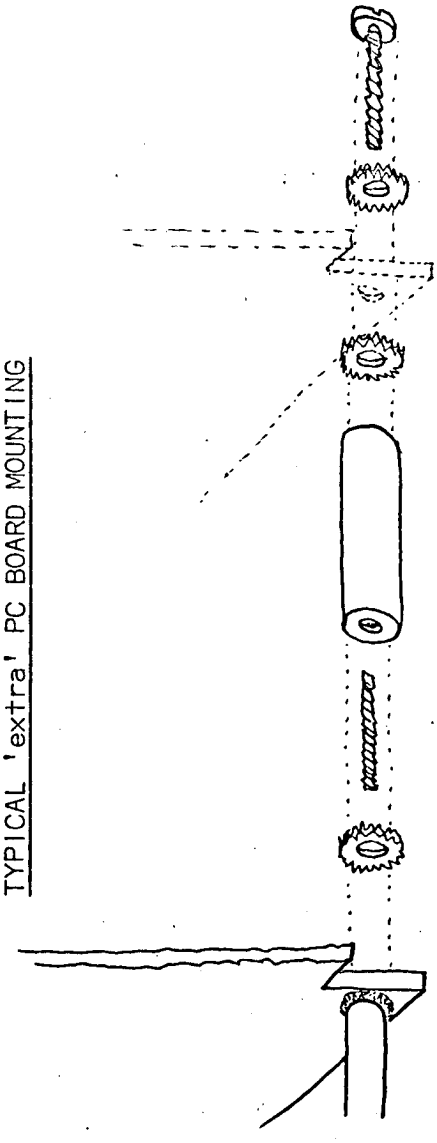


SYMBOL:



CW = clockwise

TYPICAL 'extra' PC BOARD MOUNTING



4-40 screw

star washer

extra PC board

star washer

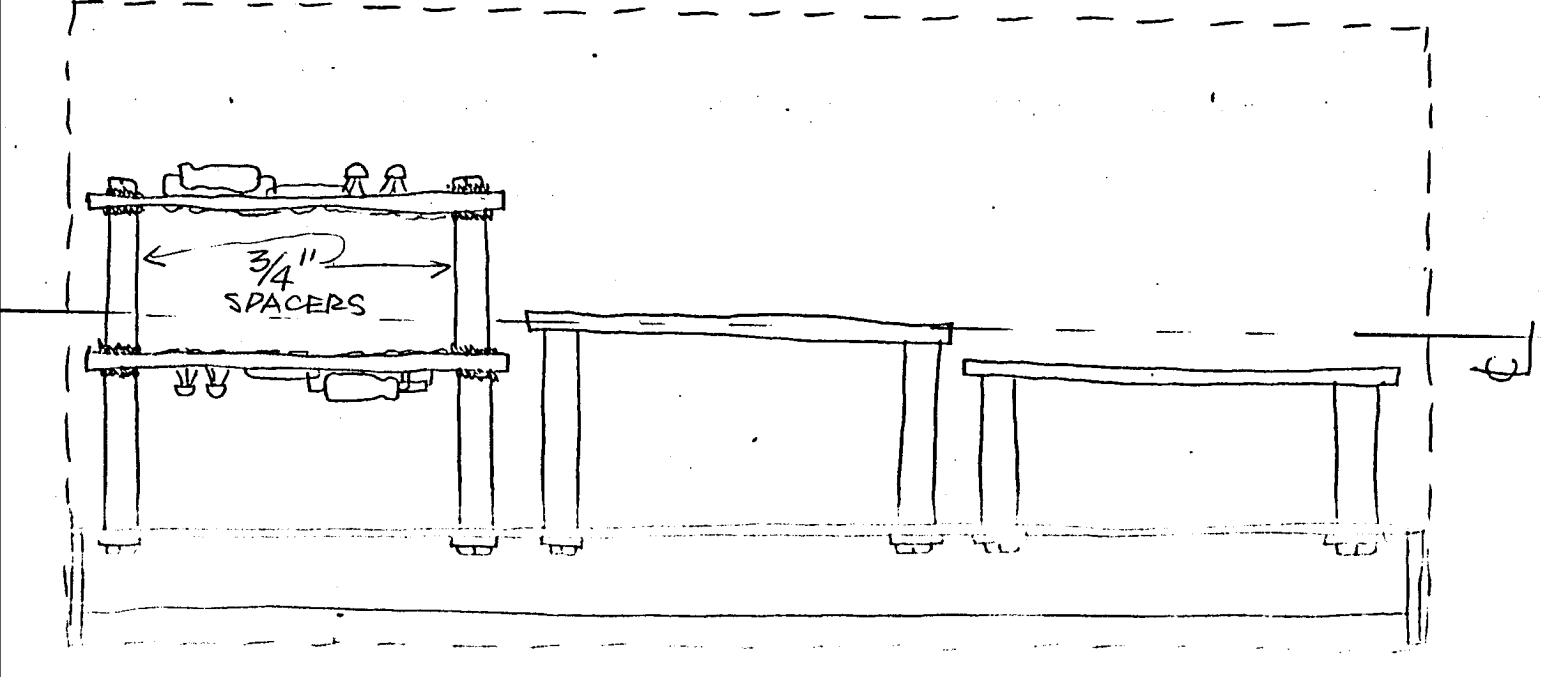
3/4" spacer

4-40 screw with head cut-off
making a 'threaded-shaft' screw-able
into both spacers

star washer

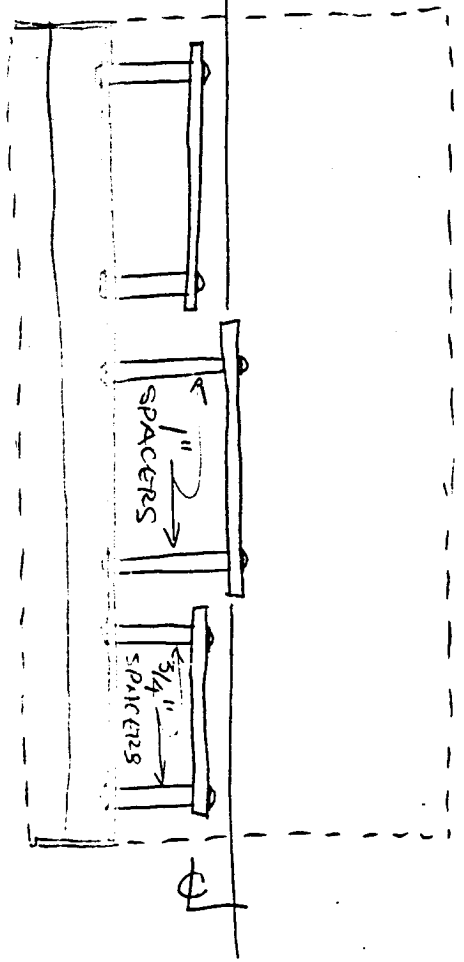
PC board

NOTE: Use additional washers for proper spacing when necessary; make sure that middle board is dead-on with center line of module.



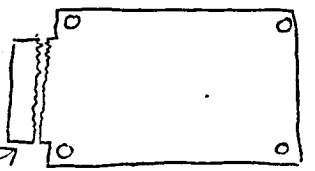
PRINTED CIRCUIT BOARD MOUNTING

BACK:

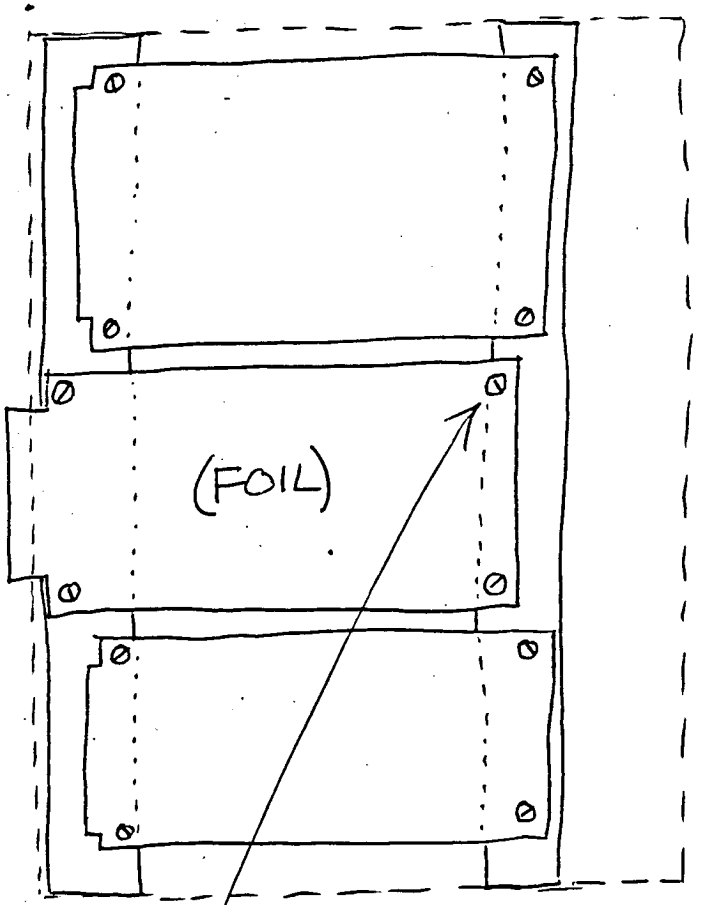


Adjust middle board so as to be dead-on with center line of module; use washers for additional spacing if neccessary.

On top and bottom boards it is necessary to hacksaw off 3/8" on power buss end for clearance of back panel.

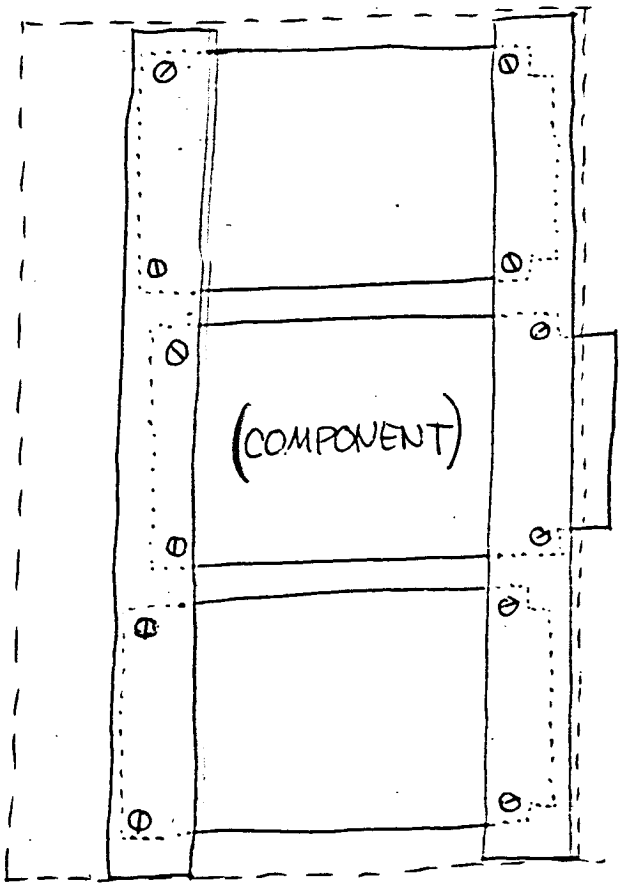


LEFT SIDE:



Crucial screw; circuits all run to ground (⏚) at this point.

RIGHT SIDE:



Star washer all 4-40 screws which hold boards to supports.

Use #6 x 3/8" panhead self thread - ing screws for mounting supports to chassis box (no washers).