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ENCLOSURE KIT - ENC1

The PANAXIS ENC1 enclosure kit has sufficient room to install up to four kit sub-assemblies. Combinations of our FME, SG, FMA, and PS kits may be used to create (1) Mono or Stereo cable modulator (2) Mono or Stereo 5 Watt Exciter/transmitter (3) Mono or Stereo 10 Watt Exciter/transmitter.

CAUTION: Read ALL directions BEFORE attempting assembly

The layout and wiring drawing is too long to fit on a single page and has therefore been cut in half and placed on two pages. Guide marks are included on each half so they may be cut and pasted or taped together to recreate the original 17" drawing.

The layout drawings are to scale and may be used as drilling templates. The black dots indicate 4-40 screw clearance holes. If you purchased our ENC1 kit then holes have already been provided for you. If you have decided to build your own enclosure from scratch however you should use these drawings as a guide. When each sub-assembly is installed according to the drawings you should have a stable and trouble-free total assembly. When these sub-assemblies are mounted in some arrangement other than that shown the results can be unpredictable.

INSTALLATION

All sub-assemblies should be completed before attempting their installation. This includes all soldering, wire trimming and removal of solder flux. All boards will have some wires that must connect somewhere else. Be sure they are on the board, and are long enough to reach where they are going, BEFORE installing the sub-assembly in the enclosure. An exception to the required single wires are the power supply switch wires. In this case solder the switch wires to the power supply board, install board, then install switch in front panel.

The power supply, FME, SG and terminal strip are fastened to the chassis with 4-40 screws, 1/4" aluminum spacers and 4-40 hex nuts. The FMA uses 3/16" spacers. Screws are inserted into the chassis from the outside. A 1/4" aluminum spacer is slipped over each screw. The sub-assembly is positioned over the screws and fitted into place. Hex nuts are threaded onto the screws and tightened against the pc board.

Installing the FMA board: Apply a little heat-sink compound (available at RADIO Shack stores) between the holes on the power transistor's mounting shoe. Position the FMA above its 4-40 screws and spacers and gently push into place. Put on the hex nuts but DO NOT TIGHTEN YET. From the bottom of the chassis thread in the 6-32 transistor mounting screws. Tighten each carefully while avoiding and binding that may occur. Once

the transistor(s) is properly seated just tighten the 6-32 screws until they are "snug" don't overdo it! Last of all tighten the 4-40 nuts.

The FMA output lead must be kept as short as possible. That's why the RF connector is directly above that point on the board. Keep it straight up and cut it off right at the connector's center terminal and solder it.

Terminal strip: The 10 point terminal strip is a little hard to work after it's installed. It would be wise to install each of the resistors first. Bend each of their leads around the terminal to hold them in place (don't solder yet), then mount the strip. Connect each sub-assembly's wires as shown in the wiring layout and solder. No need to install wires for any sub-assembly which won't be installed at this time.

Power supply outputs: The cable modulator and 5 Watt exciter units use the PS1000 supply which has both a -12 volt (blue wire) and +12 volt (red wire) output. The 10 Watt exciter uses the PS1200 supply which has a -12 volt output and TWO +12 volt (2 red wires) outputs. The layout drawing shows both red wires, one going to terminal 3 the other to terminal 9 of the 10 point strip. For the cable modulator terminal 9 is not connected to anything. For the 5 Watt exciter terminal 9 must be connected to terminal 3 of the 10 point strip.

Meter calibration resistors: The left and right channel resistors are placed in series with the stereo generator's input leads like this:

Cut the wires close to the input jacks. Slip a 3/4" long piece of shrink tubing on the longer wire. Solder a 3.9K resistor between the two wire ends. Slip the shrink tubing over the resistor. Heat the shrink tubing with your soldering iron (don't touch it).

Calibration of meter switch position #1 (5 or 10 Watt output) is done on the FMA board itself. For 5 Watts R11 should be 100K Ohms. For 10 Watts R11 should be 150K Ohms. These resistors are part of the ENC1 kit. Meter switch position #1 is not used for the cable modulator assembly.

The "composite" test calibration resistor is installed on the meter switch between terminals 5 and 6.

Stereo generator output to FME wide band input: When assembling the boards use a 1" long lead for the output of the SG and another for the input of the FME. After the boards are installed remove 1/4" of insulation from each of the wires. Twist the ends together along with another wire which must go to the meter. Solder the twisted ends. Place a piece of shrink

tubing over the splice and carefully shrink it with your hot soldering iron (don't touch it).

FME output lead: When assembling the boards use a 1" long lead of bare wire for the FME output and another for the FMA input. After the boards are installed bend the wire toward each other to make as direct a connection as possible. Cut off any excess lead length. Tack solder the two together. If the FMA is not used then the FME output wire should be 2" long and goes directly to the RF connector's center pin.

LED connections: The long lead of each LED is the "positive" lead. The shorter lead is connected to a ground point. If these leads are reversed the LED will not operate.

AC power connections: One terminal is connected to the enclosure itself. The "ground wire" (green) of a 3-wire power cord is connected to this pin. The other two pins must be insulated where they come through the chassis. This is done by slipping a 3/4" piece of shrink tubing far down on each of the wires. The wires are then carefully wrapped around their terminals keeping the "lump" of wire as small as possible. Solder the wire and let cool. Slip the shrink tubing over the soldered area and THROUGH the hole in the chassis. Shrink the tubing with your soldering iron (don't touch). When done properly the tubing will shrink to hold itself in place.

Fuse holder: Remove fuse from holder before soldering to the fuse holder terminals.

Ground points: Three grounded "solder lugs" are required. One on the end terminal and mounting screw of the AC power barrier strip. Another on one of the mounting screws of the meter, and the third on the mounting screw of the 10 point terminal strip.

FME + 12 volt inputs: The FME's oscillator and PLL circuits are energized when AC power is switched on (terminal 3 on strip). The FME's output transistor however is not energized until switch #1 is on (terminal 1 on strip). It's important that these wires are connected to the right places.

SG + 12 and -12 volt wires: The stereo generator is energized when AC power is switch on. Its -12 volt (blue wire - terminal 7 on strip) and +12 volt (red wire - terminal 3 on strip) are "snaked" around the FME board.

FMA + 12 and -12 volt wires: The FMA's -12 volt (blue wire) runs under the FMA board to terminal 7 of the strip. It's +12 volt wire (red) is active only after switch #2 is on (terminal 10 of strip).

Cover plate: The unit may be operated with the cover plate removed while testing. To keep unwanted radio frequencies contained however the cover should be installed after testing. The cover is fastened to the chassis with four sheet metal screws.

Tune up proecedures

Set your desired frequency with the 12 position DIP switch on the FME board. See the FME instructions for switch settings.

Turn your meter switch to position 9. Press the right hand button to switch on the exciter. The green LED should light. The meter may read high for a few seconds but should drop back to a lower value after a few seconds. This will indicate the PLL has locked on frequency.

Set your meter switch to position 2. Press the left hand button. The yellow LED should light and the meter should indicate the exciter's output. Follow your FME instructions for tuning and tune to obtain a maximum meter reading.

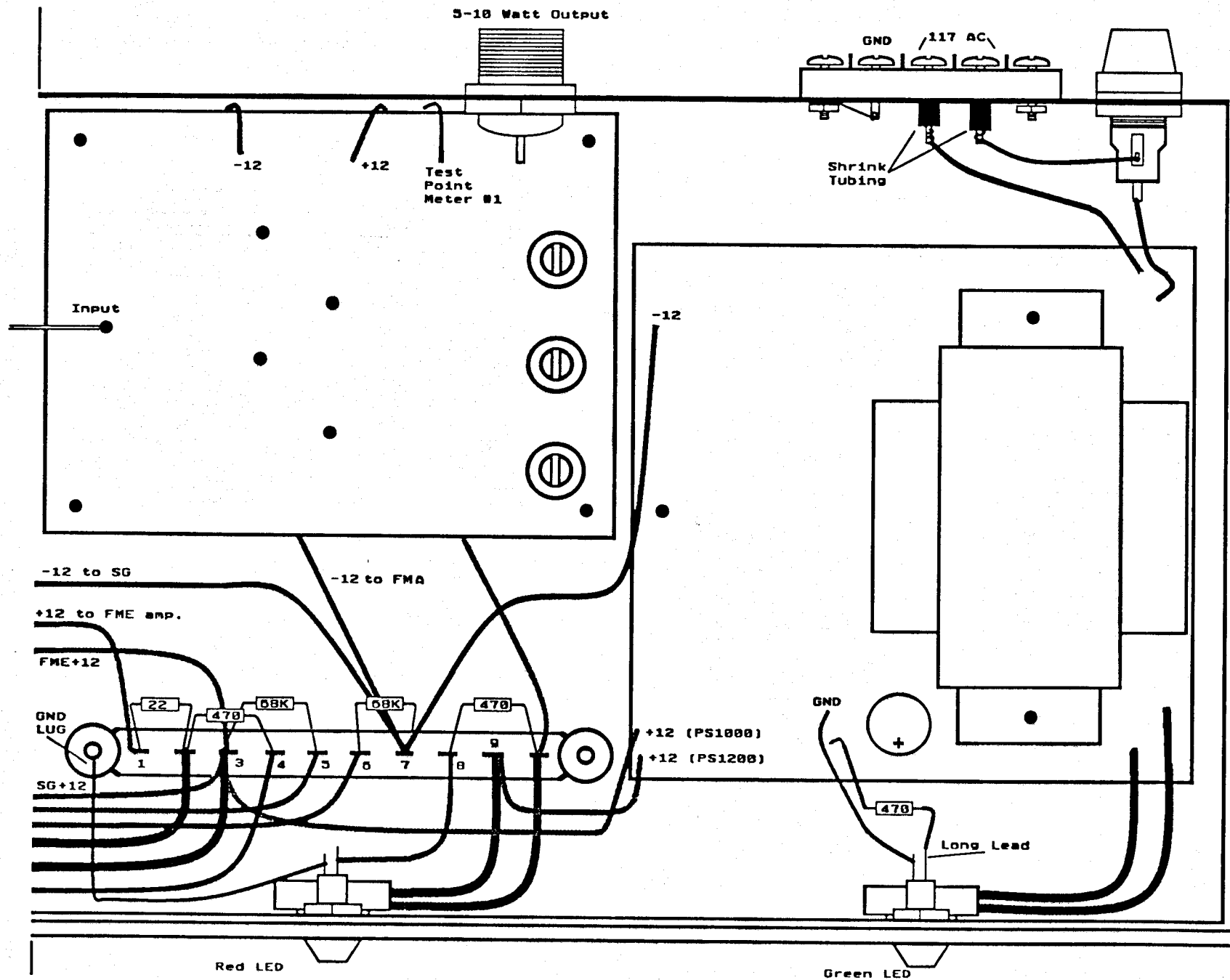
Set your meter switch to position 6. Refer to your stereo generator instructions. Adjust output level for maximum reading on your meter. Adjust its pilot level for minimum reading. Adjust sub-carrier balance for minimum reading. This last adjustment will be a "null" indications (about center of the trimpot). Use a magnifying glass if necessary to obtain the best possible low reading.

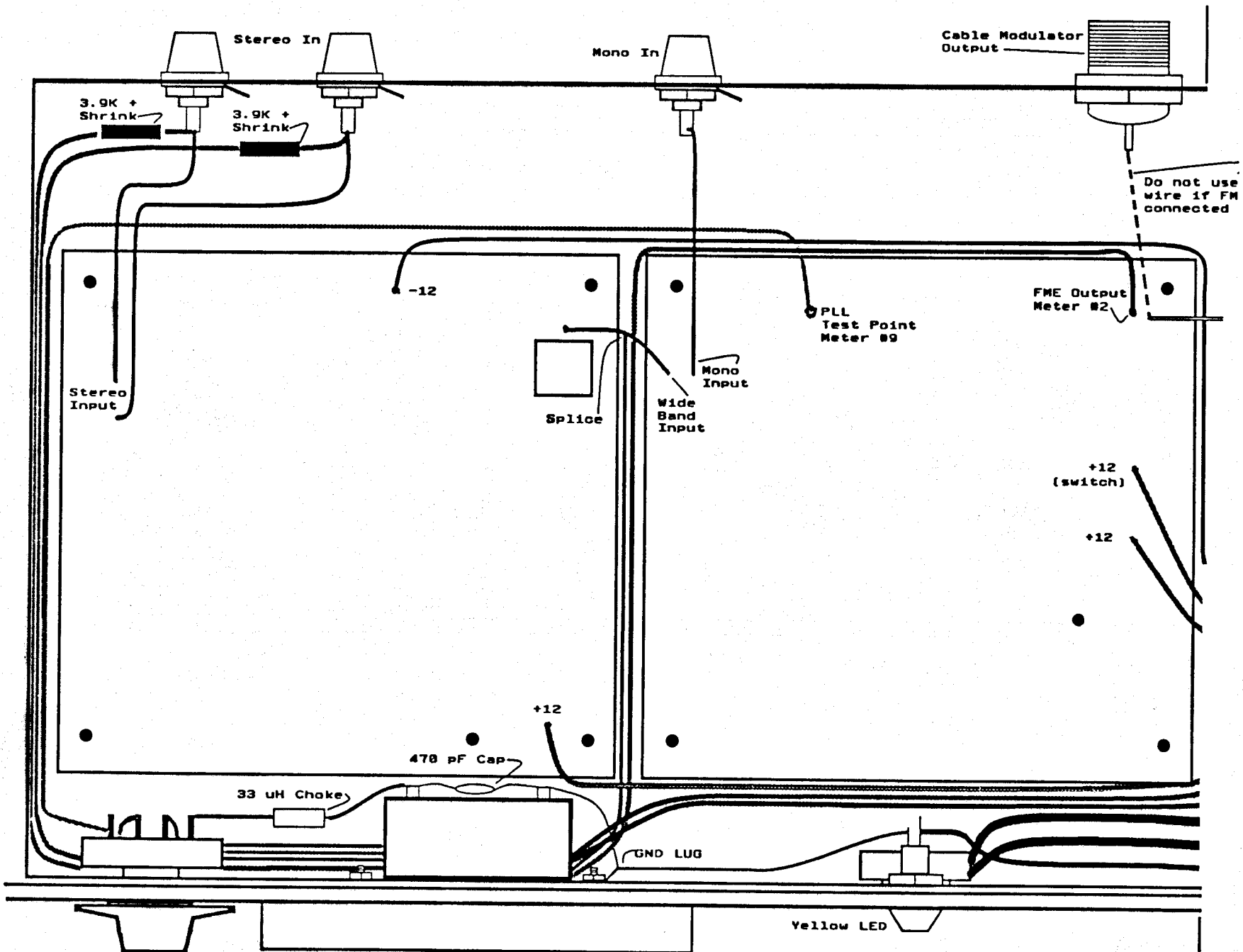
Set your meter switch to position 3. Apply an audio signal to both the left and right input jacks. Increase the audio signal until the meter pointer just touches the "0" VU (red). Set your meter switch to position 4 - you should obtain the same reading.

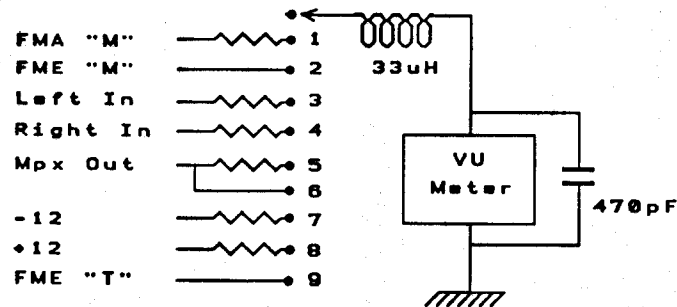
Set your meter switch to position 5. Adjust your stereo generator's output control to obtain a meter reading of about 60%. Remove the audio signal and adjust the stereo generator's pilot level to obtain a meter reading of 15%.

Apply a good quality stereo signal to the audio input jacks. Adjust its level so it just peaks into the red (100%). Listen to a stereo receiver and adjust the level control on your FME until what you hear is about as loud as other stations. Due to the pre-emphasis built into the stereo generator the level readings you see on meter positions 3 and 4 will not be the same as position 5.

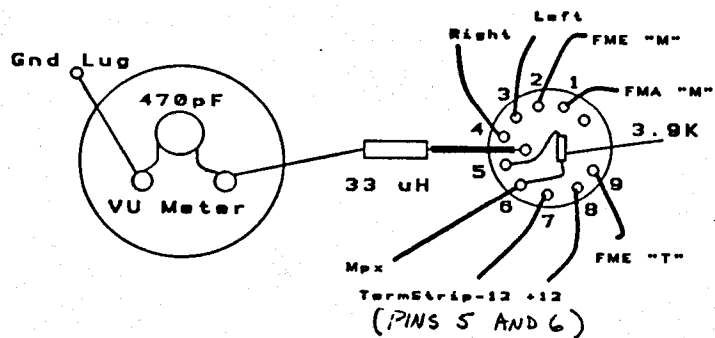
If you feel you're not getting the proper left-to-right stereo separation you may want to touch up the stereo generator's L-R balance control by ear. See the Stereo generator instructions for details.







Metering Schematic



Pictorial of Meter Switch Wiring

Parts Required

- | | |
|---------------------------|--------------------------------|
| 3 - 3.9K 1/4W resistors | 3 - RCA jacks |
| 2 - 68K 1/4W resistors | 1 - CH239 (coax jack) |
| 3 - 470 Ohm 1/4W resistor | 1 - 10 pos. rotary switch |
| 1 - 22 Ohm 1/4W resistor | 1 - 10 pos. numbered knob |
| 1 - 33 uH choke | 1 - Calrad 3 1/2" VU Meter |
| 1 - 470pF disk cap | 1 - TRW 3-140-Y barrier block |
| 1 - 2A fuse | 1 - Miniature fuse holder |
| 1 - 10 point solder strip | 3 - push/on-push/off switches |
| 3 - inches shrink tubing | 3 - panel mount LED indicators |
| 3 - Solder lugs | 4 - 4-40 x 1/2 screws w/nuts |
| 4 - #4 sheet metal screws | 2 - 4-40x 1/4 screws w/nuts |
| Misc . #24 insulated wire | |
- 1 - 100K or 150K 1/4 W resitor for meter calibration (5 or 10W unit)

Metering resistors for switch functions 2 and 9 are located on the FME circuit board.

Resistors for switch functions 7 and 8 are located on the ENC's power distribution terminal strip.

Resistors for functions 3 and 4 are shown on the ENC wiring layout next to and in series with the Left and Right input jacks. With 3.9K resistors the meter indicates +4dBm at 100%. Changing these to 10K resistors changes the 100% reading to +10dBm.

The resistor for function 5 is located between pins 5 and 6 on the switch itself.

The value of the metering resistor for function 1 depends on the power output of the FMA circuit board. Use 150K for a 10-watt unit, 100K for a 5-watt unit. The resistor should be installed in the R11 position on the FMA circuit board.

The metering switch should not be left in position 6 or 9 after initial testing and tuning. Suggested positions for monitoring are either 1 for observing power output or 5 for watching modulation.

Position 1 does not indicate actual power but shows the RF output voltage instead. The scale is linear for voltage readings but the voltage seen varies not only with power but also the SWR (antenna match) of the system. A high SWR may produce higher or lower readings than expected. Only when the SWR is 1.2 or less will the reading be a true indication of power. The relationship between power and voltage is not linear however - use the following to estimate power output:

- 100% on meter = 100% of rated power
- 71% on meter = 50% power
- 50% on meter = 25% power
- 25% on meter = 12.5% power
- %

Position 5 shows the composite output level from the stereo generator. It Left + Right audio, the Left-Right encoded subcarrier and the 19 kHz pilot. The meter pointer therefore will not always follow the movements of your audio mixer or console. In addition the stereo generator includes pre-emphasis which increases the level for higher frequencies (required for proper Frequency Modulation). This makes the low frequencies appear much lower in level on this meter than they actually are. Meter position 5 therefore shows "modulation" not an audio level as it appears on your mixer.