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INSTRUCTION MANUAL

MODEL 4114

2 METER POWER AMPLIFIER

CAUTTON:

The RF power levels present in this amplifier can cause painful RF burns. Use caution when working with this equipment. Do not touch any exposed connections. Connect and disconnect all RF connections with the DC power and drive power OFF.

MODEL 4114

The FALCON Model 4114 2 Meter Power Amplifier is a versatile, rack mounted, amplifier designed for 13.8 Volt operation. It will amplify FM, SSB, RTTY, Digital, and CW signals.

SPECIFICATIONS:

FREQUENCY RANGE....144 to 148 MHz

POWER INPUT.....1/2 to 4 Watts (4 W max.)

POWER OUTPUT.....2 W in = 100 W out

1 W in = 70 W out, or more

MODES.....FM, SSB, CW, RTTY, etc.

D. C. POWER13.8 Volts at 20 Amps nominal

INPUT IMPEDANCE...Nominal 50 Ohm

LOAD IMPEDANCE....50 Ohm

DUTY CYCLE.....Intermittent - internal overtemperature protection. Continuous duty when fan is installed

SIZE......Standard 8 3/4" x 19" rack panel

INSTALLATION:

Because this amplifier can be used in many applications specific installation instructions are difficult to give. However, a few general comments are in order.

Securely mount the amplifier and be sure it is properly grounded. Ground for the normal RF reasons and to avoid a shock hazaard in case your power supply or fan develop problems.

Mount the amplifier away from sources of heat and where air can circulate freely over it. If you are operating in intermittent duty without a fan, make sure to remove the baffle from the front of the heat sink to assure adequate air flow. A trim strip is supplied to cover the air holes in the panel when the baffle is not used.

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For continuous duty operation you must install a small fan. Air passage holes in the panel, mounting holes for a 3 1/8" square fans, a heat sink baffle, and a thermostat to control the fan, are supplied for convenience.

When using forced air, make sure the baffle is installed on the front of the heat sink.

The 4114 draws about 18 Amps at full power. Use short lengths of heavy wire (#10, or larger) to connect to the power source. To avoid a possible fire, or other damage, install a fuse or circuit breaker at the source end of the wire.

Keep coax runs short. Avoid sharp bends and the pinching of cable. The antenna should be matched to an SWR of better than 1.5:1 for best results. Higher SWR will not damage the amplifier, but will degrade the performance.

OPERATING PRECAUTIONS:

CAUTION: RF power levels in this amplifier can cause painful RF burns. Use caution! Do not touch any exposed connections. Always connect and disconnect all RF connections with the DC power and drive power OFF.

OUTPUT POWER.....100 Watts is enough power to cause heating of low quality coax and fittings. Use high quality to keep losses low.

DRIVE POWER......Keep drive power below 4 W.
Higher power may destroy the
input transistor and VOID ANY
WARRANTY.

SSB OPERATION.....Adjust drive level, or mike gain, of the exciter for best "on the air" performance. Too much drive causes overloading with accompaning distortion and high spurious output.

CASE TEMPERATURE...High power output means the possibility of high heat sink temperatures. Assure free air circulation. A thermostat will turn the amplifier off at 175 degrees F. It will come back on when it cools to 145 degrees F. Continuous duty operation requires a fan.

TERMINATIONS.....This high gain amplifier may possibly oscillate when very poorly matched. Assure it is properly terminated.

FRONT PANEL FUNCTIONS:

The Model 4114 has 1 switch and 3 lamps. Their functions are as follows:

POWER/OFF - - When ON, the power amplifier is on standby. Application of RF power, or grounding the EXT KEY line, turns the amplifier on.

POWER INDICATOR - Turns on when the POWER switch is on. This LED will go out if the amplifier overheats and come back on when the amplifier has cooled.

TRANSMIT INDICATOR - Turns on when the amplifier is keyed.

OVERHEAT INDICATOR - Turns on when the amplifier has overheated or, if the fuse on the RF PC board is blown, The amplifier is now in a straight-through mode.

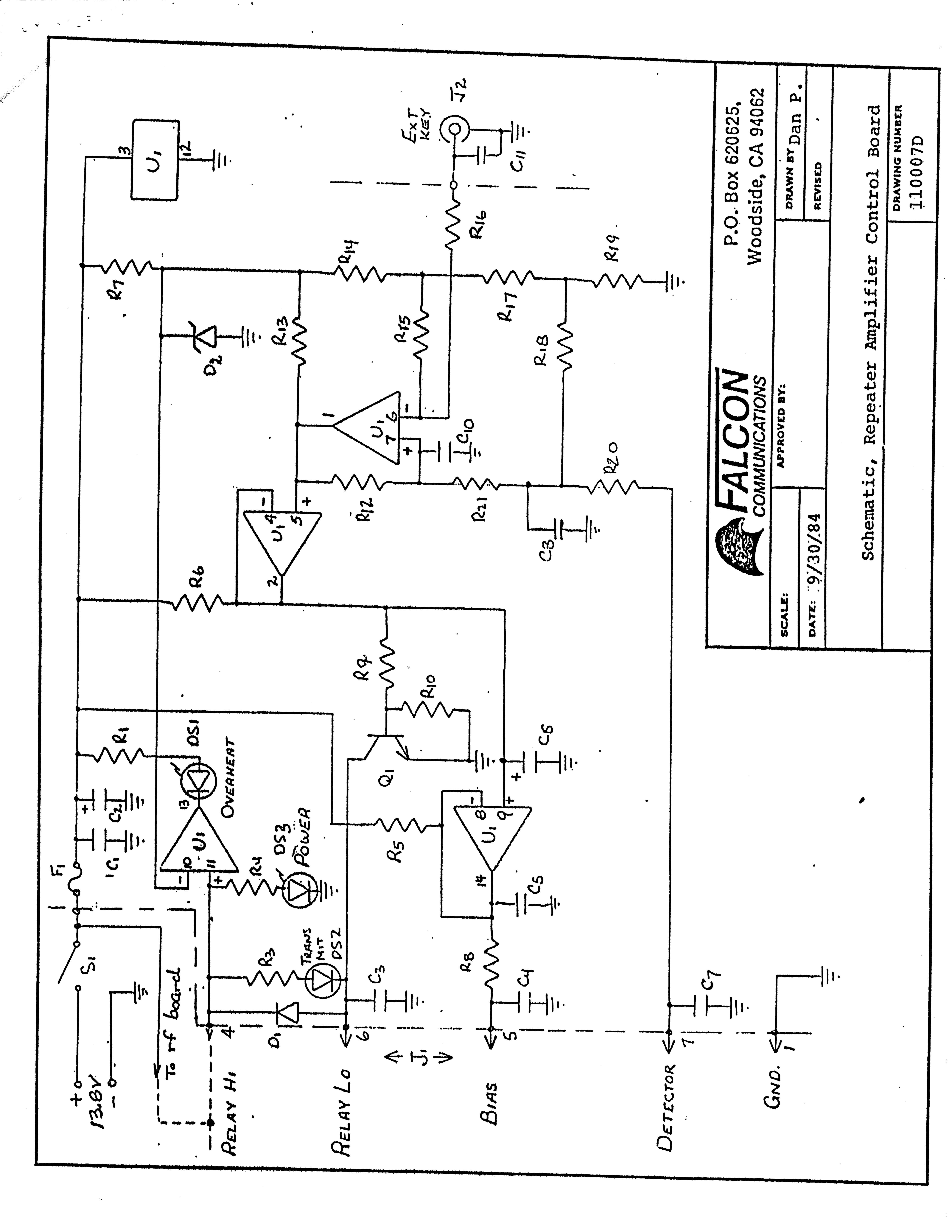
ADJUSTMENTS:

EXT KEY - External Keying line. Grounding this line turns the amplifier on.

FUSES - A 25 Amp. fuse is located on the RF PC board and a 1/4 Amp. fuse is located on the control board. If either fuse "blows", determine the trouble before replacement.

RF ADJUSTMENTS - The RF adjustments have been factory set and should not require adjustment. However, the input tuning is normally set for minimum input VSWR and the output tuning set for maximum output power. The VSWR adjustment is somewhat dependendent on input level.

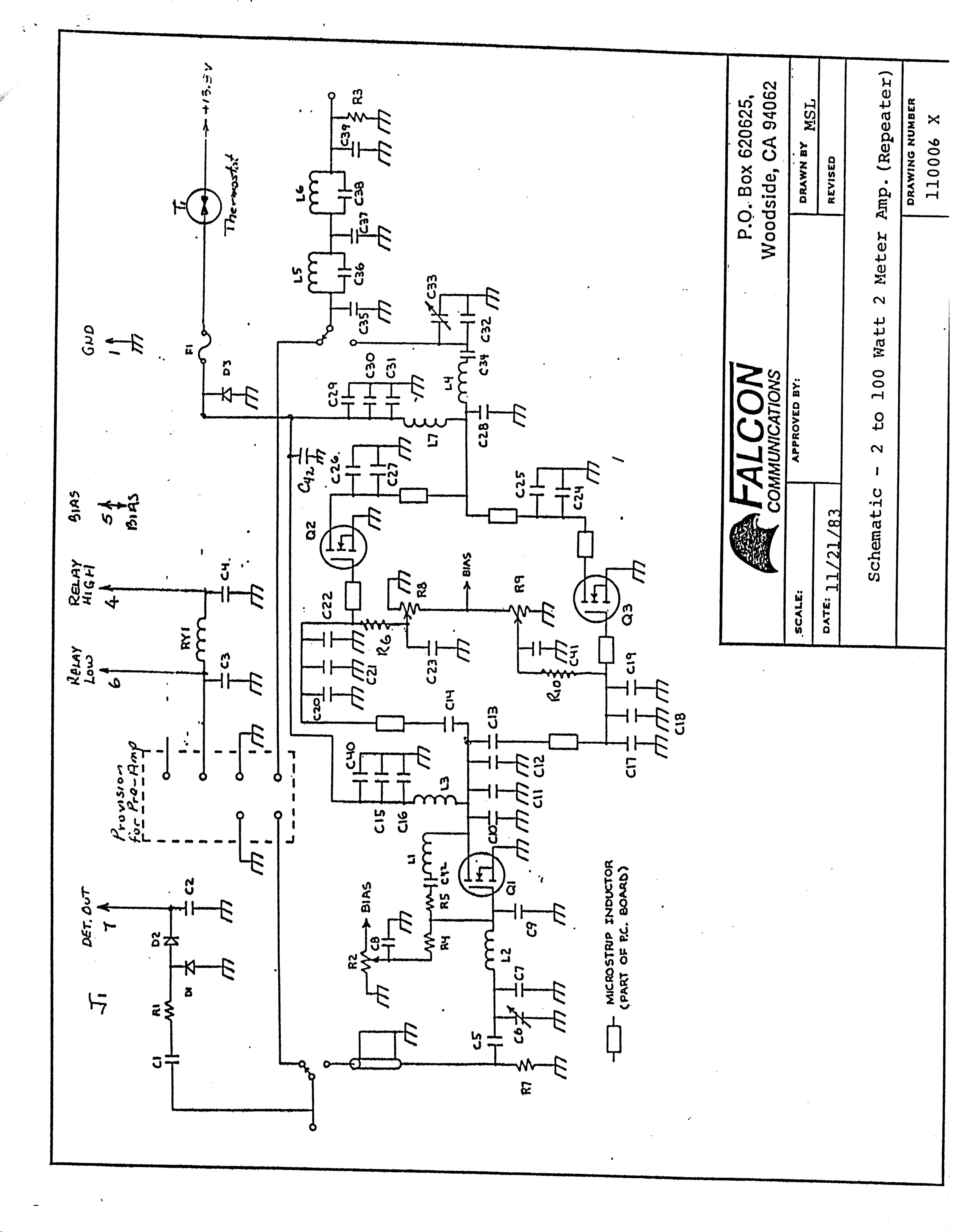
BIAS - The internal bias potentiometers should not need adjustment. However, this is the procedure. Set all three bias potentiometers (R2, R8, R9) to zero and measure the current drain and note the small current drawn by the amplifier control board when the amplifier is keyed with the EXT KEY line. Increase the bias on Q1, by turning R2, until the current increase by 2 Amps. Next turn R8, to bias Q2, until the current increase an additional 3 Amps.Finally, turn R9, to bias Q3, until the current increase 3 more Amps; bringing the total current to 8 Amps above the initial small current.



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470 pf +20% disc ceramic, ZSF or Z5U
      100 uf 16 Volt electrolytic, standup
C3 470 pF +20% disc ceramic, Z5F or Z5U
C4 3.3 uF T6 Volt, dipped tantalum
C5 470 pF +20% disc ceramic, Z5F or Z5U
C6 1 uF 35 Volt, dipped tantalum
C7 470 pF +20% disc ceramic, Z5F or Z5U
C8 1 uF 16 Volt, dipped tantalum
      1 uF 16 Volt, dipped tantalum
      Diode. 1N4001
D2
      Diode, 1N4001
      Zener Diode, 8.2 Volts +5%, 1N756A
D3
      12 Volt LED Panel lamp, Red
12 Volt LED Panel lamp, Yellow
DS2
DS3 12 Volt LED Fanel lamp, Green
      Fuse. 1/4 Amp. AGX/8AG
      9 Pin miniature nylon plug, Molex #03-06-1092 with 5 #02-06-2103 male terminals
RCA Phono jack
      Transistor, 2N4401
Q1
      Fart of DS1
       Not used
RS
      Fart. Of
                DS2
日中
       Fart of DS3
F.S
                  +5%,
       1000 Ohm
                        1/4 Watt, carbon film
       1000 Ohm +5%, 1/4 Watt, carbon film
Ro
      270 Ohm +5%, 1/4 Watt, carbon film
       100 Ohm 75%, 1/4 Watt, carbon film
RA
RG
       4.7K +5%, 1/4 Watt, carbon film
       1000 Ohm +5%, 1/4 Watt, carbon film
R10
F(1.1
       Not used
      22 Meg ±10%, 1/4 Watt, carbon film
      10k +5%, 1/4 Watt, carbon film
27k +5%, 1/4 Watt, carbon film
       150k +5%, 1/4 Watt, carbon film
F(15)
       10k +5%, 1/4 Watt, carbon film
R16
       1000 Ohm +5%, 1/4 Watt, carbon film
      47k +5%, 1/4 Watt, carbon film
R18
       1000 Ohm +5%, 1/4 Watt, carbon film
R19
       1000 Ohm +5%, 1/4 Watt, carbon film
R20
       470K +5%. 1/4 Watt, carbon film
R21
       Switch, Toqule
51
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Quad comparator, 1M2901

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PARTS LIST - 110006X
        2.2 pf +5% disc ceranic, NPO
        470 pf 75% disc ceramic. NPO
        470 pf +5% disc ceranic, NPO
       470 pF +5% disc ceranic, NPO
470 pF +5% disc ceranic, NPO
        2-20 pF mica trimmer, Arco 402
24 pF metal encased mica, Unelco J101
470 pF +5% disc ceramic, NPO
100 pF metal encased mica, Unelco J101
       250 pf metal encased mica, Unelco J101
        100 pF metal encased mica, Unelco J101
        100 pf metal encased mica, Unelco J101
  C13 100 pF metal encased mica, Unelco J101
       100 pf metal encased mica, Unelco J101
       470 pf +5% disc ceramic, NPO
       470 pf +5% disc ceramic, NPO
       Factory select
       100 pf metal encased mica, Unelco J101
       100 pf metal encased mica, Unelco J101
       Factory select
       100 pF metal encased mica, Unelco J101
       100 pf metal encased mica, Unelco J101
       470 pF +5% disc ceranic, NPO
       100 pf metal encased mica, Unelco J101
       100 pf metal encased mica, Unelco J101
      100 pf metal encased mica. Unelco J101
100 pf metal encased mica, Unelco J101
       100 pf metal encased mica, Unelco J101
      1 uf, 35 Volt, dipped tantalum
470 pf +5% disc ceranic, NPO
       470 pf +5% disc ceramic, NPO
       Factory select
       2-20 pf mica trimmer, Arco 402
     560 pF +5% dipped mica
10 pF +5% disc ceramic, NPO
       10 pf 75% disc ceramic. NPO
      15 pf 75% diec ceranic, NPO
       10 pf +5% disc ceranic, NPO
      10 pf +5% disc ceranic, NPO
40 luf, 35 Volt, dipped tantalum

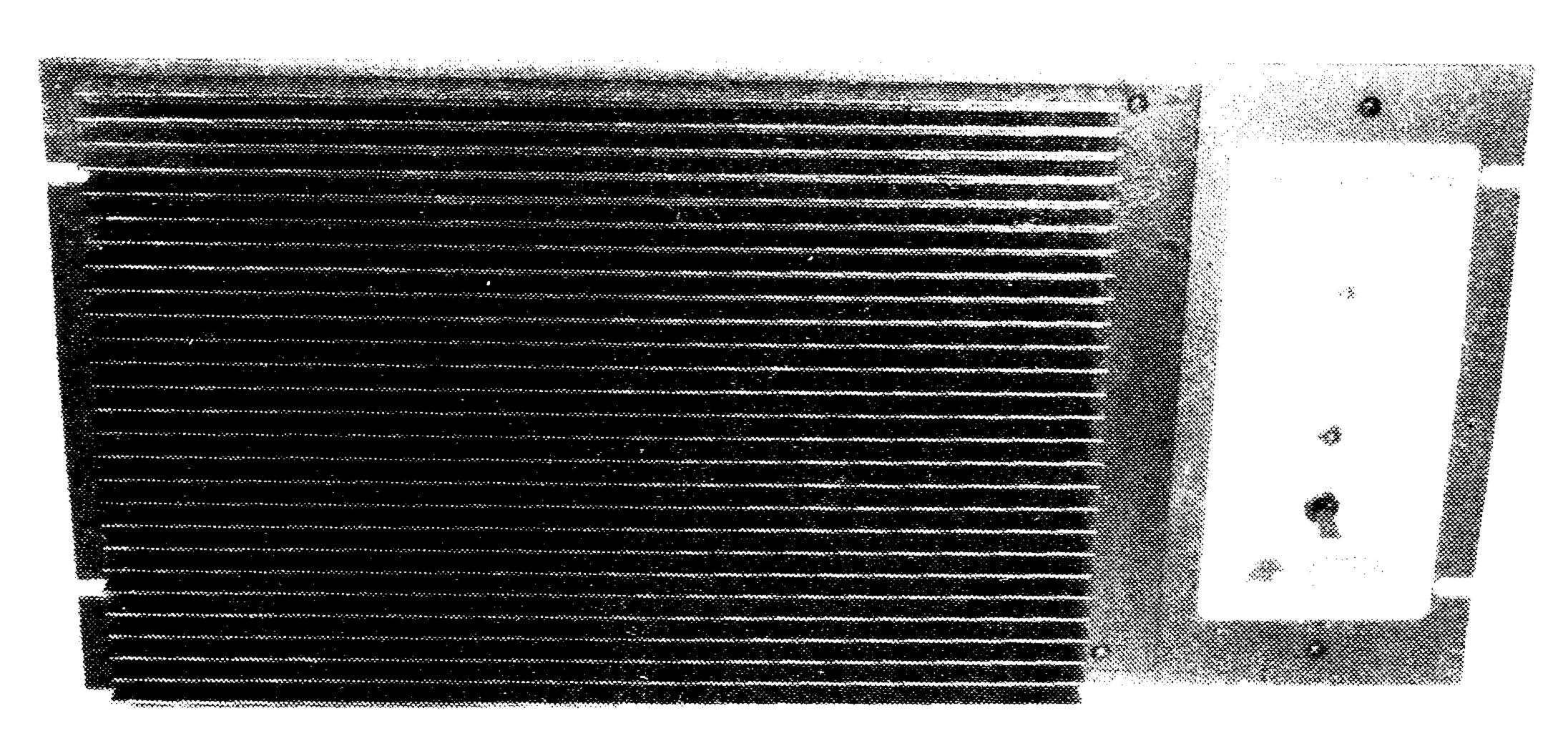
241 470 pf +5% disc ceramic, NPO

C42 1000 uf 16 Volt electrolytic
       Diode, 1N4148
       Diode, 1N4148
      Diode, MR750
      Fuse, 25 Amp, AGC25
Jl 9 Pin miniature nylon receptacle, Holex #03-06-1091
      7T #20E 5/32" 1D
      2T #20E 5/32" 10
      5T #16E 1/4" ID
     2T 1/8" copper 3/16" ID 3T #20E 5/32" ID
      3T #20E 5/32" ID
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5T #16E 1/4" ID

MOSFET Base/Repeater Amplifiers

These all mode amplifiers, with the low noise advantages of MOSFETs, require a 13.6 Vdc power source (except as noted). Mounted on an 83/41 rack panel with a large heat sink, they are designed for continuous duty at full power output when cooled with a small, customer supplied, fan. Mounting provisions and control thermostat are supplied.



4111 100 Watt 2 Meter Amplifier. 20 Watts in = 100 out; 10 in = 90 out; 2 in = 30 out. List \$295

4112 100 Watt 1¼ Meter Amplifier. 25 Watts in = 100 out; 10 in = 70 out; 2 in = 25 out.

List \$295

5113 50 Watt 2 Meter Amplifier. 6 Watts in = 50 out; 2 in = 25 out. No fan needed. NEW List \$235

4114. 100 Watt 2 Meter Amplifier. 2 Watts in = 100 out; 1 in = 80 out. **List \$365**

5140 35 Watt 2 Meter Amplifier. 2 Watts in = 35 out; 1 in = 20 out. Requires a 28 Vdc supply. No fan needed. NEW List \$255

5141 80 Watt 2 Meter Amplifier. 5 Watts in = 80 out; 2 in = 40 out. Requires a 28 Vdc supply. **NEW List \$340**

5142 100 Watt 70 Cm Amplifier. 30 Watts in = 100 out; 10 in = 40 out. Bipolar, not MOSFET. NEW List \$375

"Building-Block" Amplifiers

These basic amplifiers, mounted on a 10" x 10" heat sink, are designed for incorporation as part of another piece of equipment. Many amplifiers in this advertisement are available in this form, with various features included, or deleted. Customers supply: cabinetry; cooling air flow, if needed, switches; indicators; control circuitry; etc..

Contact us with your needs.

