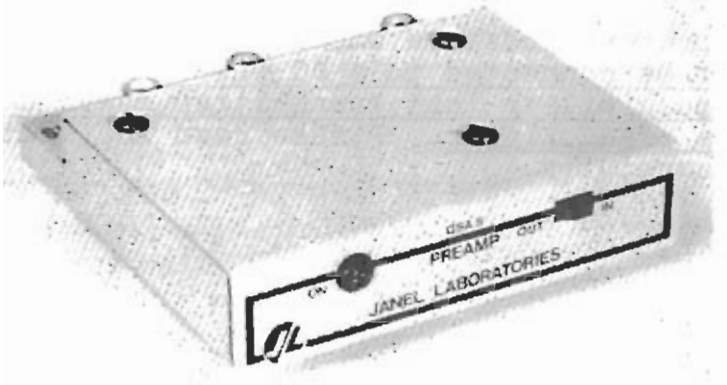
INSTRUCTION BOOK

MODEL QSA 5 PREAMP



Typical Specifications

FREQUENCY: 144-148 MHz
NOISE FIGURE: 2 db
BANDWIDTH: 4 MHz
GAIN (Receive): 16 dB
VSWR (Transmit): 1.2
TRANSMIT POWER: 1 to 30 watts
POWER: 12 volts @ 60 mA
SIZE: 1 x 3.5 x 4 inches
2.5 x 9 x 10 cm.

JANEL LABORATORIES

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QSA 5 Preamplifier

Your Janel Model QSA 5 Preamplifier is a precision piece of electronic equipment, designed to give you years of top quality performance. The QSA 5 is basically a receiving preamplifier designed to be used with FM, AM and SSB transceivers. It has automatic switching; application of transmitter power automatically switches the preamp out of the circuit which permits you to transmit through the QSA 5. The QSA 5 may also be switched manually using the slide switch on the front panel marked "In/Out".

WARNING: To prevent possible damage to your transceiver, the QSA 5 must be connected to a DC power source whenever there is any possibility that transmitter power could be applied to the preamplifier. Please read the section on installation carefully.

INSTALLATION

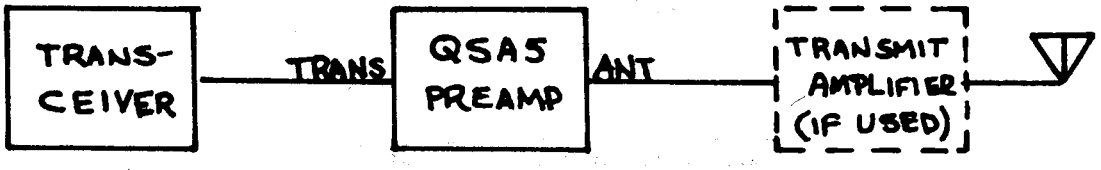


FIG. 1 - RF CONNECTIONS

The QSA 5 should be connected between your transceiver and antenna, unless you are using a transmitter power amplifier. In this case, the QSA 5 should go between the transceiver and the transmitter power amplifier (see Fig. 1). This is to prevent exceeding the power rating of the QSA 5. The jack on the rear panel marked "Transceiver" should be connected to your transceiver, of course, and the jack marked "Antenna" should be connected to your transmitter power amplifier or to the antenna.

The QSA 5 is designed to sit on the rubber feet on the bottom of its box. In addition, a full scale drawing is provided to show the location of screws in the top of the box. These screws (#6-32 threads) may be used to fasten the preamp to a suitable mounting bracket. The low profile of the QSA 5 facilitates under-dash mounting for mobile applications.

The QSA 5 is designed to operate at 12 to 14 vdc (at about 60 mA), which is applied to the wires coming out of the back of the box (red positive). As mentioned previously, the QSA 5 must have DC power whenever there is any possibility that transmitter rf power could be applied. When used in a

base station, you may wish to obtain the 12 v from inside the transceiver. For example, many transceivers have 12 v available on the power switch. In a mobile application, where your transceiver obtains power from your car battery thru the ignition switch, you may wish to connect the QSA 5 at the same point. This will insure that the QSA 5 has power whenever the transceiver does. The case of the QSA 5 is at ground potential and the unit is only suitable for use with vehicles having a negative ground system.

OPERATION

The "In/Out" Switch permits you to receive signals with or without the QSA 5. When the "In/Out" switch is in the "In" position, received signals will be boosted by the QSA 5 preamp. Application of transmit power automatically connects the transceiver directly to the antenna.

When the "In/Out" switch is in the "Out" position, the transceiver is connected directly to the antenna, for both receiving and transmitting. This permits reception in the presence of strong local signals that would otherwise overload the transceiver if boosted by the preamp. It is suggested that you leave the "In/Out" switch in the "In" position during normal operation, and that you switch to the "Out" position when in the presence of overly strong signals.

It is possible to demonstrate the effectiveness of the QSA 5 preamp by operating the "In/Out" switch while listening to a particularly weak signal. You'll be surprised at how well the QSA 5 pulls signals in right out of the noise.

The Pilot Light on the front panel indicates the switching status of the preamp. When the "In/Out" switch is in the "In" position, the light will glow dimly until transmit power is applied to the preamp; it will then shine brightly. When the "In/Out" switch is in the "Out" position, the pilot light will remain un-lighted at all times.

The QSA 5 has variable delay switching. This means that when the "In/Out" switch is in the "In" position, the transceiver remains connected directly to the antenna for a brief period after you cease to apply transmitter power. This prevents "clipping" of conversations that would occur in SSB operation. The delay has been factory set to a length that should be satisfactory for this mode of operation. However, it can be adjusted by inserting a small screwdriver into the hole marked "Delay" (see Fig. 5) in the back panel and turning the adjusting screw (counterclockwise to lengthen the delay, and clockwise to shorten it). It is important that the screwdriver have a non-metallic shaft to prevent shorting internal points to the QSA 5's case. For operation on FM or AM it may be desirable to shorten the delay to the minimum value.

SERVICE

We strongly recommend that no tuning adjustments be made when placing the QSA 5 into service. The preamp has been carefully aligned between 50 ohm loads. In addition, it has been designed to be insensitive to exact source and load impedances. However, if these impedances are far from 50 ohms, you may wish to retune the preamp. This should be done by inserting a small screwdriver with a non-metallic shaft (again, to prevent shorting internal points to the QSA 5's case) into the adjustment holes on the rear panel (see Fig. 5) and turning the adjusting screws. The output should be tuned for maximum gain, and the input for minimum noise figure. However, it is usually possible to obtain acceptable performance by tuning both capacitors for maximum gain.

No adjustments require removing the preamp from its box. However, service measurements can be made by doing so. This requires removing the three screws in the top of the box, and gently pushing the pilot light towards the inside of the box until it pops loose from the panel retainer. Unsolder the leads going to the coax connectors. The top of the box may now be lifted off.

Listed with Fig. 2 is a table of normal operating DC voltages. It is normal for voltages in individual units to vary from the given voltages by 25 to 50%. The test points can be located by referring to Figure 3.

WARRANTY

All JANEL preamps are warranted, for one year from date of purchase, against defects in materials and workmanship.

JANEL LABORATORIES will pay shipping back to the owner on all products returned for warranty service.

Liability is limited to repair or replacement, at our option, of defective products returned to our plant. Repaired units will be returned to the purchaser at JANEL's expense.

Before returning a unit on warranty or for service, write to JANEL stating full particulars of the problem. Shipping instructions will be provided by return mail.

5-11-77

PARTS LIST

MODEL QSA 5 PREAMP

COMPONENT	JANEL PART NO.	DESCRIPTION
C1 to C11, C16	02001	470pF Disc Capacitor
C12, C13	02039	Variable tuning capacitor
C14, C20	02010	4.7 Disc Capacitor
C15	02028	10MFd Electrolytic Capacitor
C17	02014	2pF Ceramic Capacitor
C18, C19	*	Factory selected value nominal value 4.7pF
R1	11023	47k ohm ¼ watt Resistor
R2	11024	68k ohm ¼ watt Resistor
R3	11007	100 ohm ¼ watt Resistor
R4, R8	11013	1k ohm ¼ watt Resistor
R5	11011	470 ohm ¼ watt Resistor
R6	11025	100k ohm ¼ watt Resistor
R7, R9, R13, R14	11019	10k ohm ¼ watt Resistor
R10	11054	500K ohm Trimmer Pot
R11	11017	4.7k ohm ¼ watt Resistor
R15, R16	11021	22k ohm ¼ watt Resistor
R12	11003	22 ohm ¼ watt Resistor
R17, R18	11015	2.2k ohm ¼ watt Resistor
Q1, Q2, Q3, Q5	12038	2N3906 Transistor
Q4	12016	3N204 Transistor
CR1 to CR3	12007	1N4148 Diode
CR4, CR5	12001	1N4001 Diode
CR6	12022	Light Emitting Diode
L1	15037	RF Coil
L2	15038	RF Coil
K1	10002	Reed Relay
K2, K3	10003	Reed Relay
S1	14004	DPDT Slide Switch

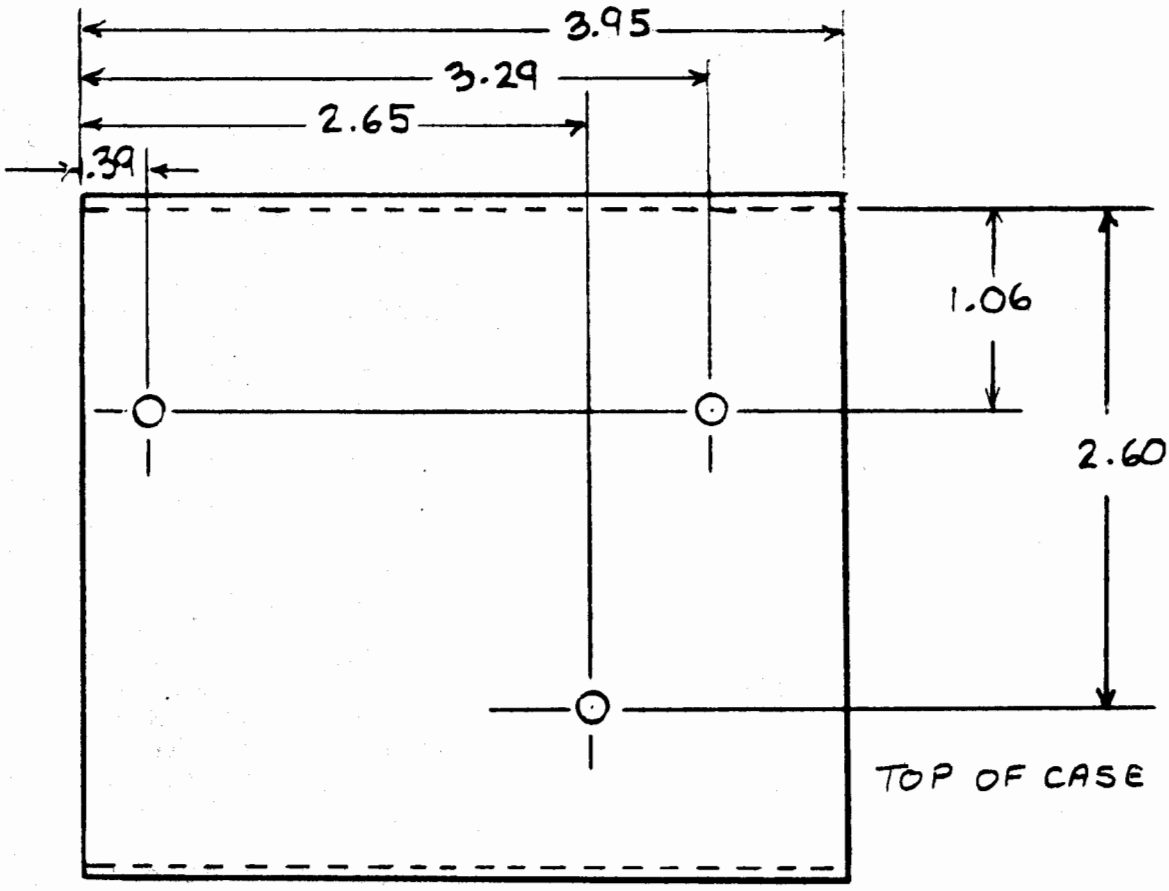


FIG. 4
MOUNTING TEMPLATE (DIMENSIONS IN INCHES)

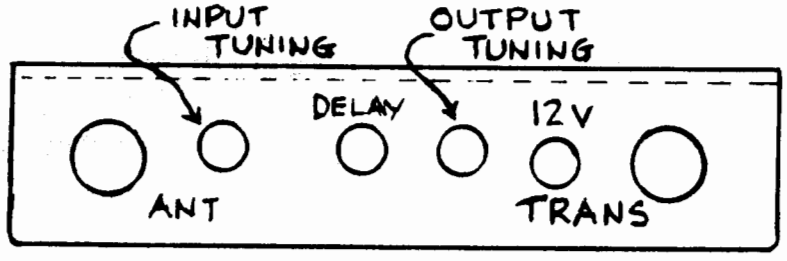


FIG. 5 BACK VIEW SHOWING ADJUSTMENTS

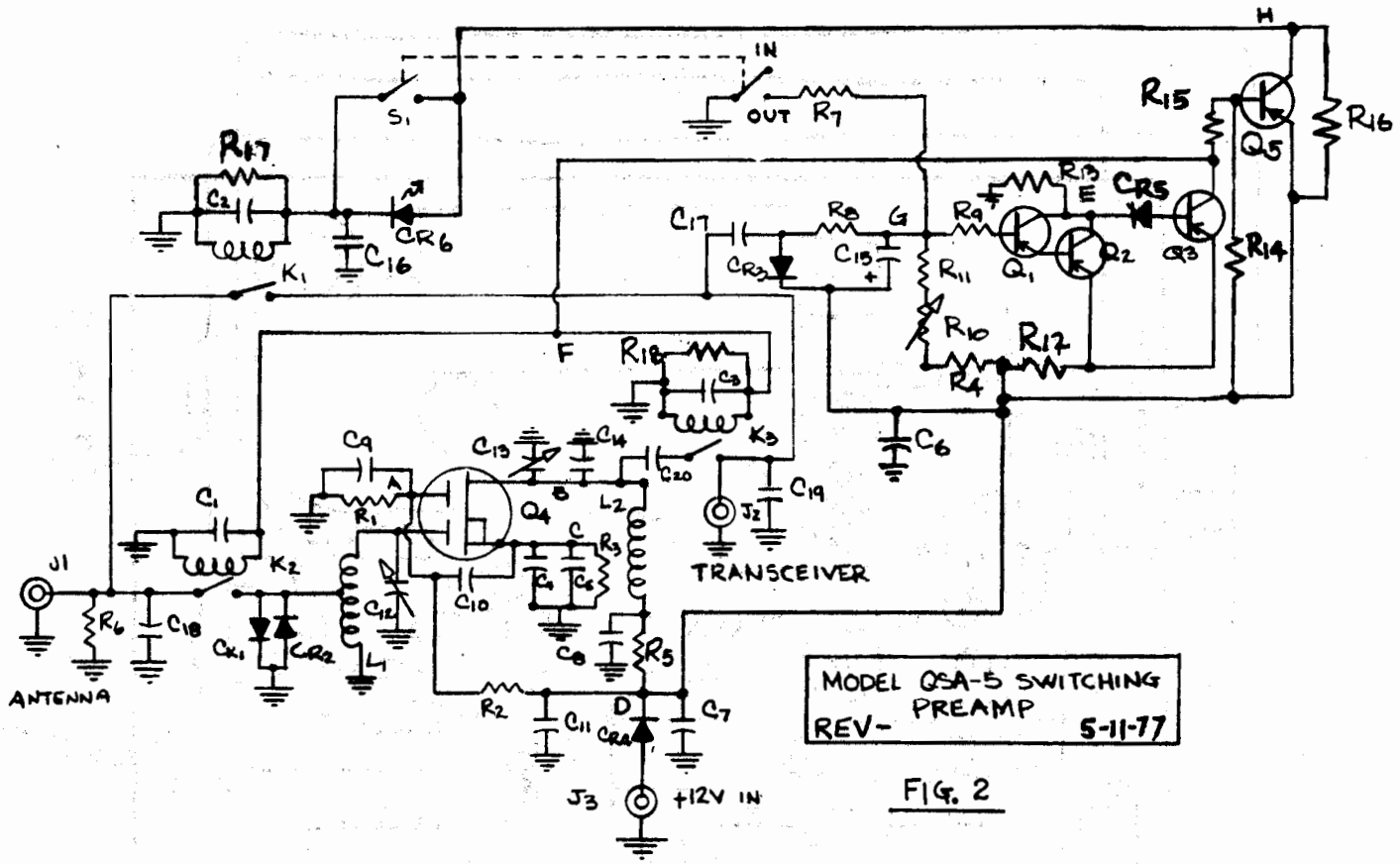
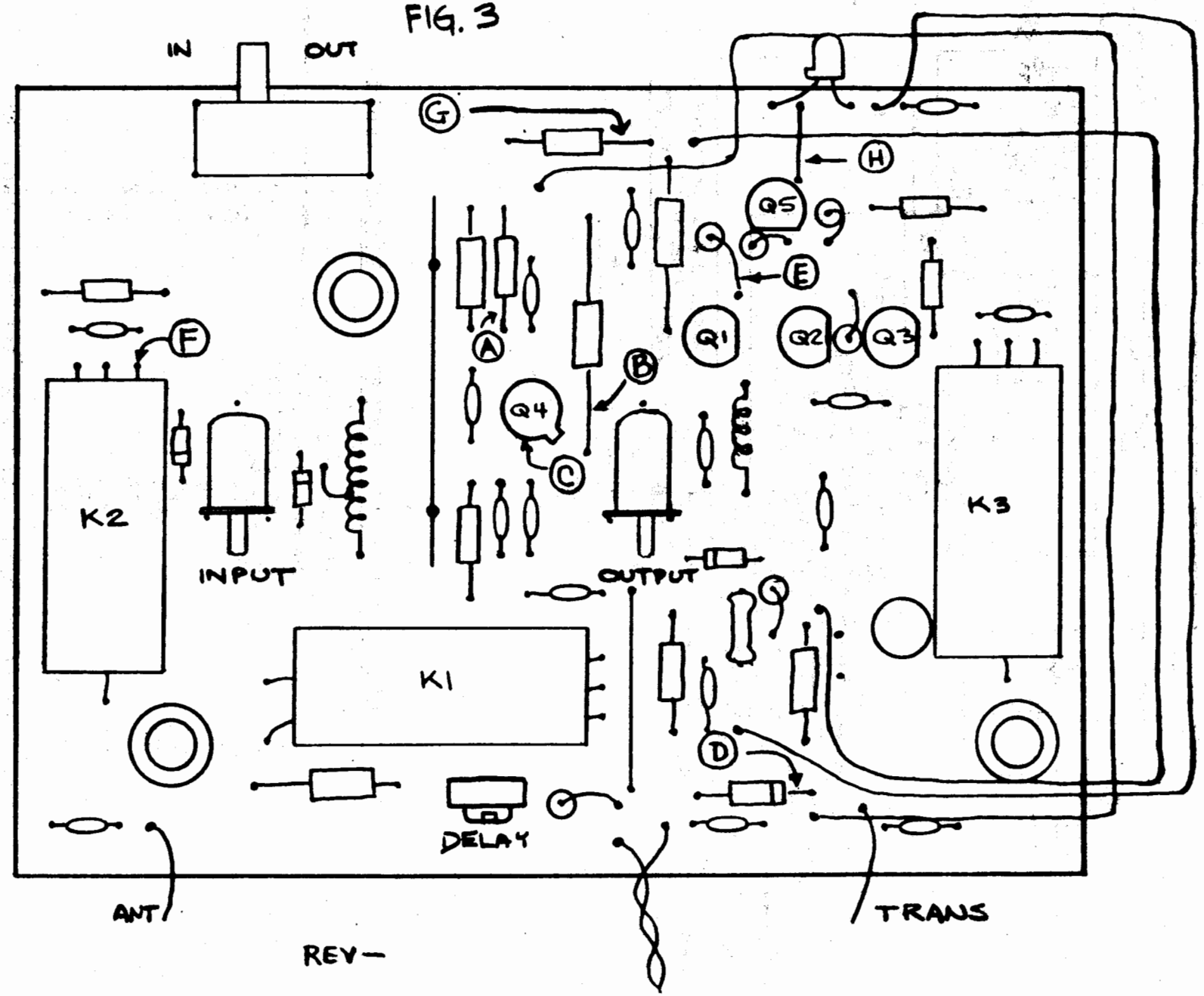


FIG. 2

TEST POINT	"IN/OUT" SWITCH	VOLTAGE (Volt)
A	Either Position	4.7
B	Either Position	7.10
C	Either Position	.4
D	Either Position	11.3
*E	IN	9.5
E	OUT	11.0
*F	IN	11.0
F	OUT	.25
*G	IN	11.2
G	OUT	5.5
*H	IN	1.7
H	OUT	11.2

*These voltages apply only when transmit power is not being applied to the preamp.

FIG. 3


IN
OUT
G
H
Q5
E
F
A
Q1
Q2
Q3
B
Q4
C
K2
K3
INPUT
OUTPUT
K1
D
DELAY
ANT
TRANS
REV—