6.7 FL-6 VHF PRESELECTOR

The FL-6 Preselector adds front-end selectivity and a small amount of gain to the receiver. The unit is mainly used to filter-out strong local "out of band" signals which otherwise would show up in the receiver as image and spurious responses, 'intermod' products, fundamental overload (blocking, "desense"), etc. The filtering is most effective on interfering signals greater than 2MHz away from the desired receive frequency. This unit is extremely helpful at sites with many nearby transmitters.

A low-noise preamp stage is incorporated after the second filter section to overcome the loss of the following four filter sections and keep the overall noise figure of the unit as low as possible. The preamp also provides an overall net gain of about 10dB which is enough to maintain or possibly improve the sensitivity of the basic receiver, (by maintaining, or lowering the overall noise figure), but not enough gain to overload the receiver's front-end.

Six 'High Q' individually shielded resonators are used in the filter section of the FL-6 to provide considerable attenuation of signals more than a few MHz away. The filter sections are slightly "undercoupled" in order to provide maximum possible selectivity. Typical selectivity is -20dB @±2.5MHz, and -60dB @±6MHz. Ultimate attenuation is 70dB typ. In side by side comparison tests with 2 or 3 section 'helical filters', the FL-6 was found to have about twice the skirt selectivity. And while they had about 2dB or more loss and actually degraded receiver sensitivity, the FL-6 has gain and typically maintains or improves receiver sensitivity! (Note that, as with all preamps, the amount of receiver sensitivity improvement will depend on the sensitivity of the existing receiver, i.e. the poorer the existing sensitivity, the greater the improvement by adding a preamp.) Of course, the front-end selectivity is always greatly improved by this Preselector, without any sacrifice of sensitivity as with most front-end filters.

The FL-6 is mounted on the top cover of the receiver, and is cabled in series with the receiver RF Input. If the Preselector should be damaged by lightning, etc., the receiver can still be operated by simply plugging the receiver RF Input cable directly into the receiver RF Input instead of into the FL-6 Input.

6.7.1 FL-6 RETROFIT

The FL-6 is mounted with 2 - 4-40 screws which thread into the two tapped holes in the removable cover. The unit is mounted with the cover side down, (label up). Be sure that the 2 screws used do not extend into the FL-6 housing more than 1/8" as they could short-out internal components.

After the unit is securely mounted, run a ground wire to the turrent ground lug, and +13.8VDC to the FT cap.

Connect the coax cable out of the FL-6 to the receiver RF Input; and the antenna cable to the SO239 Input Jack on the FL-6.

6.7.2 FL-6 PRESELECTOR ADJUSTMENT

Tuning may not be necessary as each unit is custom tuned at the factory to your specified frequency. However, if performance is not satisfactory the input and output tuning capacitors should be tuned for best quieting on a weak received signal, consistent with maximum rejection of undesired signals. (The other trim caps should not require adjustment unless the desired center frequency is moved more than ±500KHz.) Note that the tuning adjustments are ultra-sharp and critical. Tune the caps carefully - several times. In some cases, in order to achieve best overall sensitivity it may be necessary to retune the existing receiver's first input tuning cap.

In the 136-174MHz unit, an RF Gain trim pot is also included (adjustable through the third clearance hole in the side wall from the input connector). Normally, it is set for max. gain, near full CW. However, if overload or mixing products etc. are apparent in the receiver, the control may be turned CCW to reduce the gain. (The gain can be reduced to 0, or even a loss.) In this case just turn the gain control down enough to eliminate or reduce the interference, but not enough to lose a desired weak signal.

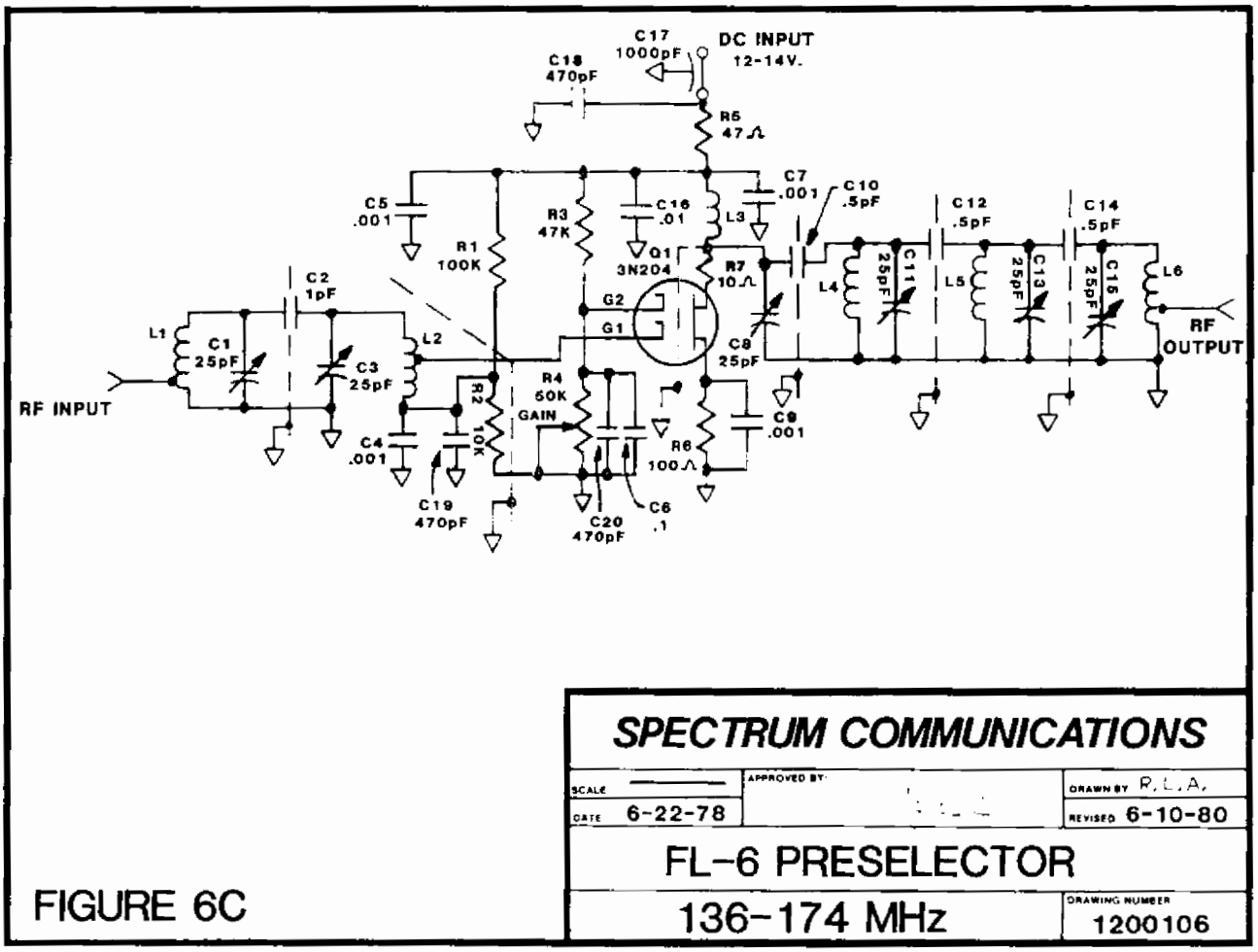
L1-C1 and L2-C3 form a double tuned input filter, sharply resonant at the desired input frequency. The output of this filter is coupled to the base of Q1, an ultra low noise device operated as a linear class A amplifier. The output from Q1's collector (or drain) feeds a very sharp 4 section filter made up of L3-C8, L4-C11, L5-C13 and L6-C15. In the 136-174MHz unit, Q1 is a dual gate F.E.T. R4, a 50K pot, provides gain control by varying the bias voltage on gate 2.

NOTE: REGARDING REMOVAL & INSTALLATION OF PRC77 & ID77 "PLUG-IN" P.C. BOARDS

In order to remove the PRC77 Power Supply/AF Mixer/COR Board for service, first unplug the AC Line cord, then unsolder the heavy black ground wire from the chasis ground lug - (this wire connects to the lower right corner of the PRC77 board when viewed from the chassis front). Remove the 4 screws which hold the board in place. (Use a very short phillips screwdriver on the 2 lower screws - not used on the later units).

Once the board is lifted out, use a screwdriver to pry open the multi-pin connector's "lock tab". Pull up on the plug, and rock it from end to loosen and remove it. The ID77 board and connector are removed in the same fashion. *DO NOT ATTEMPT to remove the large connector on the PRC77 board without first removing it from its mounting position as damage could result!*

Reverse the above basic procedure to replace the connectors and and boards. *DO NOT FORGET to resolder the heavy black ground wire!*



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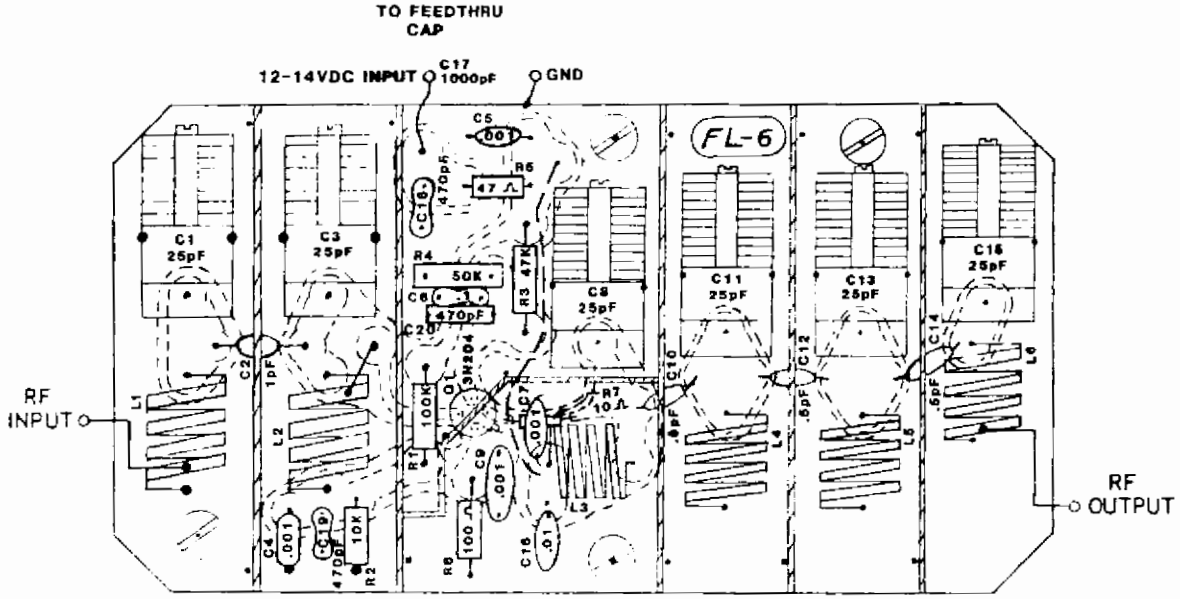
SCALE	APPROVED BY	DRAWN BY R.L.A.
DATE 6-22-78		REVISED 6-10-80

FL-6 PRESELECTOR

136-174 MHz

DRAWING NUMBER 1200106

FIGURE 6C



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FL-6 COMPONENT LAYOUT
5-6-80
R.L.A.

FIGURE 6D

136-174 MHz