RF PREAMPLIFIER
MODELS TLD8421B AND TLD8422B
& CABLE
MODEL TKN6613A

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLD8421B</td>
<td>132-150.8 MHz</td>
</tr>
<tr>
<td>TLD8422B</td>
<td>150.8-174 MHz</td>
</tr>
</tbody>
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RECEIVER WITH PREAMPLIFIER

<table>
<thead>
<tr>
<th></th>
<th>-20 DB QUIETING</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSITIVITY EIA SINAD</td>
<td>0.25 uV</td>
</tr>
<tr>
<td>SELECTIVITY (EIA SINAD)</td>
<td>0.175 uV</td>
</tr>
<tr>
<td>INTERMODULATION (EIA SINAD)</td>
<td>-95 dB at ±30 kHz</td>
</tr>
<tr>
<td>SPURIOUS AND IMAGE REJECTION</td>
<td>-75 dB</td>
</tr>
<tr>
<td>SQUELCH SENSITIVITY</td>
<td>Threshold 0.1 uV max. at 6 dB max. quieting</td>
</tr>
<tr>
<td></td>
<td>Tight 0.6 uV max. at 14 dB min. quieting</td>
</tr>
</tbody>
</table>

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>IMPEDANCE</th>
<th>50 ohm input, 50 ohm output</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT DRAIN</td>
<td>20 mA at 13.8V</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>132-174 MHz</td>
</tr>
<tr>
<td>POWER GAIN</td>
<td>10 dB</td>
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SERVICE PUBLICATIONS
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6/20/80-PHI -1- 68P81016E33-B
1. DESCRIPTION

The rf preamplifier is an optional accessory item that increases the input signal level to the receiver thereby increasing its operating range. Using the rf preamplifier in two-receiver stations results in an increase greater than 3dB in input signal level to both receivers. (In stations using two receivers, the input signal level, without preamplifier, to each receiver is reduced by 3dB as compared to one-receiver stations. Two-receiver stations also require the use of the optional two-receiver coupler).

The preamplifier kit includes a printed circuit board, a housing and a coaxial cable with rf phono-type connectors. The circuit board is plated on both sides with components mounted toward the inside of the housing. The preamplifier circuit consists of two aperture-coupled helical resonators, an FET amplifier, and an output coil.

NOTE

The rf preamplifier is capable of amplifying two or more input carrier frequencies providing that the maximum center frequency separation does not exceed 1.5 MHz. If carrier frequency separation does exceed 1.5 MHz, two rf preamplifiers are required.

2. OPERATION

The incoming rf signal is applied to the preamplifier input jack J1 through the receiver input cable. The input jack is connected to a tap on coil L1. The rf signal is coupled from L1 to L2 by utilizing the cavities in the housing to form two aperture-coupled helical resonator cells. The tapped output of L2 is applied to common-gate FET amplifier Q1 through rf bypass capacitor C6. Resistor R2 develops dc bias. Output coil L3 provides loading for Q1 and is capacitively matched by capacitor C4 to output jack J2. This provides a 50-ohm termination for the input of the rf preselector.

3. MAINTENANCE

a. General

This section provides the maintenance shop type procedures for the rf preamplifier. These bench tests include measurements with a Motorola portable test set, and procedures for testing and troubleshooting.

b. Alignment

NOTE

If the preamplifier is normally operated with more than one carrier frequency input, determine the center of the preamplifiers operating range and, if possible, use this frequency to perform the alignment. If this is not possible, align the preamplifier using the lowest carrier frequency.

Disconnect the preamplifier input and output cables and bypass the preamplifier by connecting the receiver input cable directly to the rf preselector input. Check and align the preselector according to the following procedure described in the receiver section of the manual. After the receiver has been aligned, disconnect the receiver input cable from the preselector and reconnect the preamplifier input and output cables. While monitoring position 5, align the preamplifier for maximum meter indication by adjusting the tuning coils in the following order; L3, L2, L1. For final tuning, repeat L3, L2, and L1; then tune L2 for maximum quieting.

c. Realignment

It is not necessary to bypass the preamplifier when aligning to the same frequency or to a new frequency if it is within 11.0 MHz of the previously tuned frequency. Align the rf preselector first, then adjust the preamplifier as described in the preceding paragraph.

d. Troubleshooting

With the preamplifier connected, and the test set on position 5, perform the following:

(1) Increase the signal generator output for a maximum indication on the test set meter (saturation), then decrease until a convenient reference point is reached on the test set meter (not more than 10 uA below the saturation point). Note both the test set meter indication and the signal generator output level setting.
(2) Disconnect the preamplifier input and output cables and bypass the preamplifier by connecting the receiver input cable directly to the rf preselector input.

(3) Increase the signal generator output until the same reference point is obtained on the test set meter. Note the signal generator output level setting, it should be at least 3 times greater than the previous setting for a preamplifier gain of approximately 9-1/2 dB.

(4) Reconnect the preamplifier and check the alignment if the above indications are not obtained.

(5) If there is no output or insufficient gain after the preamplifier is aligned, check for faulty components or solder connections on the printed circuit board (refer to the circuit board removal and replacement illustration).

REMOVAL PROCEDURE
1. THOROUGHLY REMOVE SOLDER FROM INPUT AND OUTPUT FEED-THRU LEADS.

AEPS-8815-0

2. REMOVE 8 SCREWS AND LIFT OFF CIRCUIT BOARD.

REPLACEMENT PROCEDURE
3. REPLACE BOARD AND SECURE WITH SCREWS.
4. RESOLDER INPUT AND OUTPUT FEED-THRU LEADS.

Preamplifier Circuit Board Removal and Replacement
ELECTRICAL PARTS LIST

MECHANICAL PARTS LIST

NOTE:
Replacement transistors must be ordered by Motorola part number only for optimum performance.