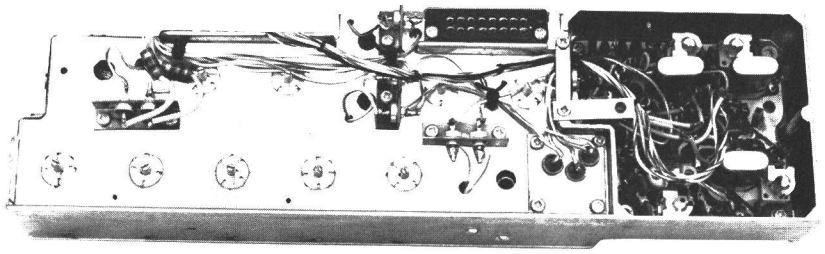
MOBILE RADIO

# MASTR® PROGRESS LINE

## 450-470 MHz DUAL FRONT END MODELS 19D413487-G1 & G2

Maintenance Manual LBI-4245C
DATAFILE FOLDER - DF8401 **********



## SPECIFICATIONS *

DUAL FRONT END 19D413487G1: With Pre-Amp
DUAL FRONT END 19D413487G2: Without Pre-Amp

| | | |
|---|---|---|
| FREQUENCY RANGE | 450-470 MHz | |
| SENSITIVITY (DFE & RECEIVER) | With Pre-Amp | Without Pre-Amp |
| 12 dB SINAD | 0.35 µV | 0.60 µV |
| 20 dB Quieting | 0.40 µV | 0.70 µV |
| INTERMODULATION (EIA) | -70 dB | |
| INPUT POWER | .010 Amps at 10 volts | |
| FREQUENCY STABILITY | | |
| Standard Oscillator | ±.0005% (-30°C to +60°C) | |
| ICOM Oscillator | ±.0002% (-30°C to +60°C) | |
| DIMENSIONS (HxWxD) | 2-14" x 11-3/4" x 4-3/8" | |

## OPTIONS

| | | | |
|---|---|---|---|
| 7351: | 1-Freq. Standard | 7356: | 3-Freq. with Pre-Amp |
| 7352: | 2-Freq. Standard | 7357: | 1-Freq. with ICOM Osc. |
| 7353: | 3-Freq. Standard | 7358: | 2-Freq. with ICOM Osc. |
| 7354: | 1-Freq. with Pre-Amp | 7359: | 3-Freq. with ICOM Osc. |
| 7355: | 2-Freq. with Pre-Amp | | |

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

DUAL FRONT END 450-470 MHz

GENERAL ELECTRIC

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## ILLUSTRATIONS

# DESCRIPTION

## DUAL FRONT END

General Electric Dual Front End Models 19D413487-G1 & G2 were designed for operation in the 450—470 megahertz band. The Dual Front End (DFE) is used with MASTR Progress Line Receivers to monitor up to four frequencies when the channel spacing is greater than 0.4% (±0.2%).

The DFE is of single-unit construction, completely housed in an aluminum casting for maximum shielding and regidity. The standard unit consists of five helical resonators, lst mixer, oscillator and three multiplier stages, and a high IF amplifier.

An optional RF amplifier stage is available whenever an increase in sensitivity is required. The chassis is mounted in a housing on the rear of the mobile frame, adding approximately three inches to the overall length of the mobile unit. A block diagram of the DFE is shown in Figure 1.

## ANTENNA SYSTEM

The Dual Front End and the receiver use a common antenna. A power splitter mounted on the front of the system frame provides approximately 20 dB separation for the two to four receive channels. Due to

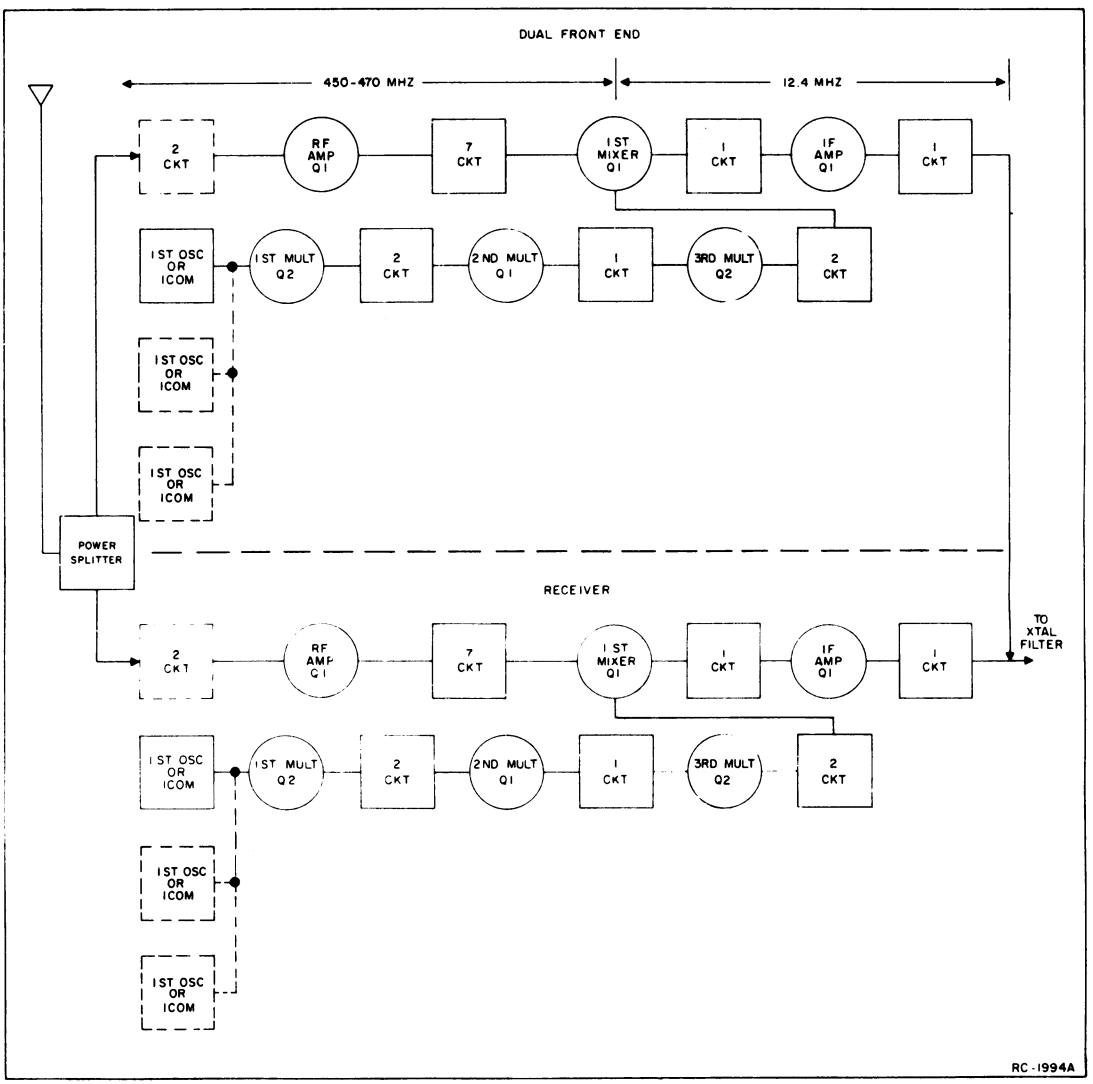



Figure 1 - Dual Front End Block Diagram

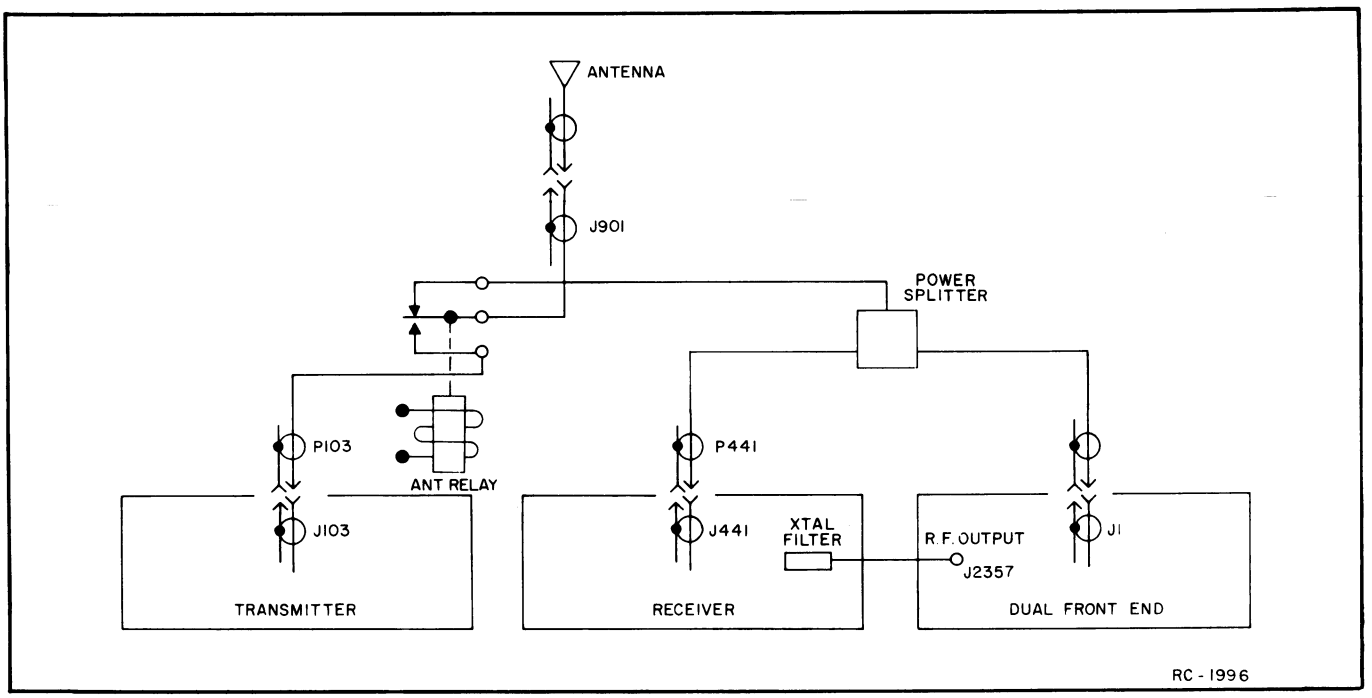



Figure 2 - Single Antenna Block Diagram

the isolation provided by the power splitter, cable lengths to the DFE and the receiver are not critical.

In standard applications, the antenna connects to J901 on the front of the mobile unit. From J901, the antenna connects to the common terminal of the antenna relay (See Figure 2). The transmitter connects to the normally-open contact on the antenna relay, while the normally-closed contact is connected to input jack J3 on the power splitter.

One cable from the power splitter connects to the DFE input jack J1, and the other cable connects to J441 on the receiver.

## CIRCUIT ANALYSIS

The MASTR Progress Line Dual Front End is completely transistorized, using six silicon transistors. A regulated 10 volts is used for all stages of the Dual Front End.

Centralized metering jack J2352 is provided for use with GE Test Set Models 4EX3A10 and 4EX8K11 for ease of alignment and servicing. The Test Set meters the oscillator, multipliers, and the regulated 10 volts.

The regulated 10 volts, oscillator keying voltages system negative, and ground connections are supplied by the two cables from receiver plug P443.

### RF AMPLIFIER A2352

RF Amplifier A2352 is used only in ultra-high sensitivity (UHS) Dual Front Ends and consists of two tuned helical resonators and an RF amplifier (Q1).

RF from the antenna is coupled through W2354 to a tap on L2353. The tap is positioned to provide the proper impedance match to the antenna. RF energy is coupled to L2354 through an opening in the shield wall, and then to the Base of Q1. The amplified output is taken from the collector of Q1 and coupled through C2 and W2353 to the input of fine helical resonators.

### HELICAL RESONATORS

In DFE's without the UHS option, the RF selectivity is provided by five tuned helical resonators L2360 through L2365. RF cable W2355 connects the RF signal from the antenna to a tap on L2360. The tap is positioned to provide the proper impedance match to the antenna. The output of L2365 is coupled through capacitor C1 to the 1st mixer assembly.

STANDARD OSCILLATOR/MULTIPLIER (A2359)

The standard 1st oscillator operates in a transistorized Colpitts oscillator circuit. The oscillator crystal operates in a fundamental mode at a frequency of approximately 16 to 19 megahertz. The crystal is cut to provide temperature compensation at the high end of the temperature range and is thermistor compensated at low temperatures. This provides ±.0005% frequency stability as soon as the power is applied -- without having to wait for crystal ovens to warm up.

A four-frequency 1st oscillator/multiplier board is provided with the DFE. The proper frequency is selected by switching the desired crystal circuit to +10 volts by means of a frequency selector switch on the control unit. See Figure 3 for the available frequency combinations.

| Receiver | D.F.E. |
|---|---|
| 1 Freq. | 1 Freq. |
| 1 Freq. | 2 Freq. |
| 1 Freq. | 3 Freq. |
| 2 Freq. | 1 Freq. |
| 2 Freq. | 2 Freq. |
| 3 Freq. | 1 Freq. |

Figure 3 - Frequency Combinations

Regulated 10 volts is supplied to the crystal circuit to forward bias one of the four diodes CR1-CR4. Forward biasing the diode reduces its impedance, so thatthe crystal frequency is applied to the base of oscillator is developed across C47. The oscillator output is coupled through C45 to the base of 1st multiplier Q2.

The 1st multiplier output is coupled through T8 to Multiplier Board A2355. T8 is tuned to four times the crystal frequency. The 1st multiplier stage is metered at J2352-4 through metering network C38, CR6, R17 and R18.

OSCILLATOR MULTIPLIER WITH ICOM (A2375)

Oscillator/Multiplier Board A2375 uses ICOM Module Model 4EG26A10. The ICOM Module consists of a crystal-controlled Colpitts oscillator, a voltage regulated and a buffer output stage. The entire module (including crystal) is enclosed in a dust-proof aluminum can, with the ICOM frequency and the receiver printed on the top. Access to the oscillator trimmer is obtained by prying off the plastic GE decal on the top of the can.

The oscillator frequency is temperature-compensated at both ends of the temperature range to provide instant frequency compensation, with a frequency stability of ±0.0002% without crystal ovens or warmers.

A four-frequency 1st oscillator/multiplier board is provided with the DFE. The proper frequency is selected by switching the desired ICOM circuit to +10 volts by means of a frequency selector switch on the control unit. See Figure 3 for the available frequency combinations.

In the DFE, +10 volts for operating the ICOM is obtained through the frequency selector switch on the control unit. With the ICOM operating, one of the four diodes CR1-CR4 is forward biased and the oscillator output is applied to 1st multiplier Q1.

The 1st multiplier output is coupled through T1 to multiplier board A2355. T2 is tuned to four times the ICOM frequency. The 1st multiplier stage is metered at J2352-4 through metering network C4, CR5, R5 and R6.

CAUTION

All ICOM modules are individually compensated at the factory, and cannot be repaired in the field. Any attempt to remove the ICOM cover will void the warranty.

MULTIPLIER BOARD (A2355)

Following the oscillator board are two multiplier stages. A2355-Q1 operates as a tripler, and Q2 operates as a doubler. Q2 is metered at J2351-1 across metering resistor R6.

The output of Q2 is coupled through two helical resonator circuits to the source terminal of the 1st mixer. The helical resonators are tuned to six times the 1st multiplier output for a total multiplication of 24 times the crystal frequency.

1ST MIXER (A2353)

The 1st Mixer uses a Field-Effect Transistor (FET) as the active device. A FET may be considered a semiconductor current path (or channel) whose resistance is varied by a voltage applied between the "gate" and "source" terminals. Lead identification for the FET is shown in Figure 4. The FET has voltage-controlled characteristics, and may be compared to a vacuum tube in operation (see Figure 4).

The FET mixer has several advantages over a conventional transistor mixer,

including a high input impedance and an output that is relatively free of harmonics (low in intermodulation products).

RF from the helical resonators is applied to the gate of Q1, and injection voltage from the multiplier is applied to the source. The mixer output is taken from the drain with the output tuned to the 12.4 MHz high IF frequency.

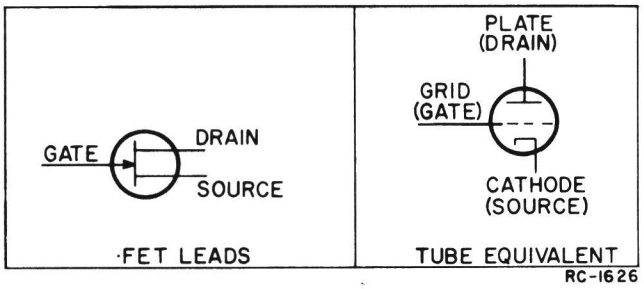



Figure 4 - FET Nomenclature

HI IF AMPLIFIER (A2362)

A series-resonant circuit (A2353-L2 and -C3) couples the mixer output to the emitter of the high IF amplifier A2362. The transistor is connected as a grounded-base amplifier which provides a low impedance for the mixer output. The amplifier output is coupled through transformer T1 to the crystal filter.

Diode Assembly 19B219305G1

The Diode Assembly 19B219305G2 is used only with 150.8-174 MHz and 450-470 MHz Receivers and Dual Front Ends. The purpose of the diode assembly is to turn off the HI IF Amplifier and 1st Mixer of the receiver or DFE when the other is operating. Refer to Figure 5 for a typical Diode Assembly connection. Because of the many frequency combinations as shown in Figure 3, the diode assembly consists of three diodes. All unused diodes are removed.

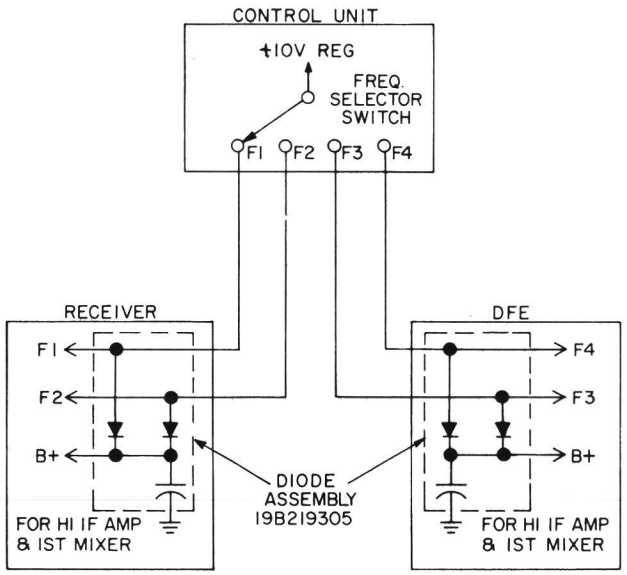



Figure 5 - Typical Diode Assembly Connections

## RECEIVER MODIFICATIONS

(MODIFICATION KIT 19A127733G1)

The MASTR mobile receiver when used with a Dual Front End option has been modified in the following manner.

1. Replaced the 3.3K-ohms resistor across the input of Crystal Filter A422 with a 10K-ohm resistor (GE Part No. 3R77-P103K).

2. Connected the center conductor of DFE output cable 19A127259G1 to the filter input, and the shield to the ground lug on the filter.

3. Soldered the leads from cables 19B204924G1 and 19B219302G1 to P443 as shown on the Outline Diagram (see Table of Contents).

4. Connected RF cable from the Power Splitter to J441.

5. Connected diode assembly to 1st Osc/Mult. (see Table of Contents).

## MAINTENANCE

DISASSEMBLY

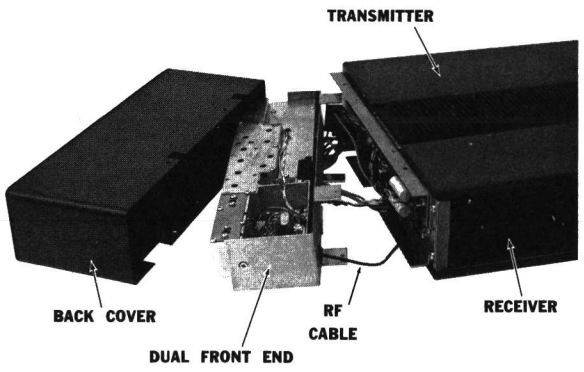



Figure 6 - Dual Front End Assembly

To gain access to the DFE:

1. Pull locking handle down and pull radio out of mounting frame.
2. Remove the four screws holding back cover to system frame. Slide cover back and lift off (see Figure 6).
3. Remove four screws from angle brackets holding Dual Front End to the system frane.
4. Carefully swing Dual Front End chassis out for servicing.

TEST PROCEDURES

Dual Front End

| SYMPTOM | CHECK |
|---|---|
| No Output | 1. Connections to P443.<br>2. Cable from J2357 to receiver crystal filter.<br>3. Antenna terminal connections.<br>4. Check 10-Volt supply with GE test meter at Pin 13 on DFE centralized metering jack J2352. |
| Low Sensitivity | 1. DFE alignment.<br>2. Cable and relay connections.<br>3. lst Mixer voltages.<br>4. lst Oscillator voltages.<br>5. HI IF Amplifier voltages. |
| Low Oscillator Reading | 1. Oscillator alignment.<br>2. Voltage readings at lst Oscillator.<br>3. Crystals Y1, Y2, Y3. |

INSTRUCTIONS FOR CHANGING FREQUENCIES WHEN THE DIODE ASSEMBLY IS USED

GENERAL

1. To increase the number of frequencies on the Receiver or the Dual Front End. A new Diode Assembly will have to be ordered for each one or both as the case may be.
2. The diodes will be connected only to the jacks that have crystals in the respective crystal sockets.
3. There will be no more than one crystal per frequency in the receiver and Dual Front End combined.

PROCEDURE

1. Select the desired frequency combination and get the connection table from the following chart:

| No. of Receiver Freq. | No. of DFE Freq. | Table |
|---|---|---|
| 1 | 1 | A |
| 1 | 2 | B |
| 1 | 3 | C |
| 2 | 1 | D |
| 2 | 2 | E |
| 3 | 1 | F |

2. Unplug all the oscillator keying leads on the receiver and dual front end.
3. Refer to the table found in Step 1. Connect the loose end(s) of the diode(s) as follows: For the receiver, find the row that has the connections for the frequency or frequencies desired. Follow the same row across for the proper Dual Front End connection(s).
4. Clip off all unused diodes.
5. Replace the oscillator keying leads removed in step 2. Connect as shown below:

White - Yellow - Brown to J5
White - Yellow - Red to J4
White - Yellow - Orange to J3
White - Yellow - Green to J6

TABLE A

| ROW | 1-Freq. Receiver | | | | 1-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | | | | | J4 | | |
| 2 | | J4 | | | J5 | | | |

TABLE B

| ROW | 1-Freq. Receiver | | | | 2-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | | | | | J4 | J3 | |
| 2 | | | J3 | | J5 | J4 | | |

TABLE C

| ROW | 1-Freq. Receiver | | | | 3-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | | | | | J4 | J3 | J6 |
| 2 | | | | J6 | J5 | J4 | J3 | |

TABLE D

| ROW | 2-Freq. Receiver | | | | 1-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | J4 | | | | | J3 | |
| 2 | | J4 | J3 | | J5 | | | |
| 3 | J5 | | J3 | | | J4 | | |

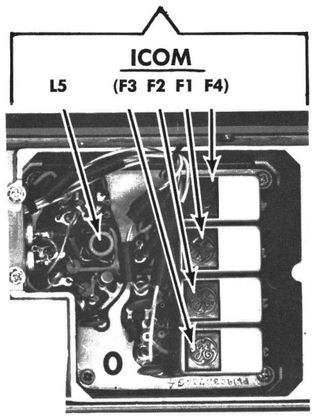
TABLE E

| ROW | 2-Freq. Receiver | | | | 2-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | J4 | | | | | J3 | J6 |
| 2 | | J4 | J3 | | J5 | | | J6 |
| 3 | | | J3 | J6 | J5 | J4 | | |
| 4 | J5 | | | J6 | | J4 | J3 | |
| 5 | J5 | | J3 | | | J4 | | J6 |

TABLE F

| ROW | 3-Freq. Receiver | | | | 1-Freq. DUAL FRONT END | | | |
|---|---|---|---|---|---|---|---|---|
| | F1 | F2 | F3 | F4 | F1 | F2 | F3 | F4 |
| 1 | J5 | J4 | J3 | | | | | J6 |
| 2 | | J4 | J3 | J6 | J5 | | | |
| 3 | J5 | | J3 | J6 | | J4 | | |
| 4 | J5 | J4 | | J6 | | | J3 | |

# 1st OSC/MULT. with ICOM




## ADJUSTMENT PROCEDURE

ICOM ADJUSTMENT
OSCILLATOR BOARD 19C311726G4

## ICOM FREQUENCY ADJUSTMENT

Due to the high stability of the ICOM module, it is not recommended that zero discriminator be used as the indication for setting the oscillator frequency. Instead, measure the ICOM frequency as described in the following procedure.

EQUIPMENT REQUIRED:

1. Frequency Counter capable of measuring the 70-80 MHz frequency range. (The counter should have an accuracy of 0.4 part-per-million.)
2. Coaxial cable with test loop as described in Figure 7.
3. Mercury thermometer.

PROCEDURE:

1. Check the ICOM temperature by taping the mercury thermometer to the side of the ICOM.
2. Connect the frequency counter to L5 (on the lst Osc/Mult) using the 4-turn test loop and cable shown in Figure 7.
3. If the ICOM temperature is 80°F (±4°F) or 26.5°C (±2°C), the frequency indication on the counter should be 4 times the frequency stenciled on the ICOM case. Adjust the ICOM trimmer (if necessary) to obtain this frequency.
4. If the temperature is not within the 80°F (±4°F) or 26.5°C (±2°C) range, use the correction curves of Figure 8 for setting the ICOM frequency as follows:
   a. Check the color dot beneath the GE emblem and select the matching curve to determine the correction factor in parts-per-million (PPM).
   b. Multiply the frequency stenciled on the ICOM by 4 and then multiply this figure by the correction factor (from Figure 8) observing the sign (±) given to the corrction factor.
   c. The frequency measured at L5 should be 4 times the ICOM frequency ± the correction factor. Adjust the ICOM trimmer (if required) to obtain this frequency.

FOR EXAMPLE

ICOM Frequency - 18.233333 MHz
ICOM Color Dot - Green
Ambient Temperature - 35°C (95°F)
Correction Factor - 1.15 PPM
(From Figure 8)

Multiply ICOM Frequency by 4;
(18.233333 MHz x 4 - 72.933332 MHz)

Multiply preceding figure by correction factor;
(72.933 MHz x -1.15 PPM = 83.87 hertz
(or -84 hertz)

Set the frequency measured at L5 for
72.933248 MHz;

72.933332 MHz
- .000084 MHz
---
72.933248 MHz

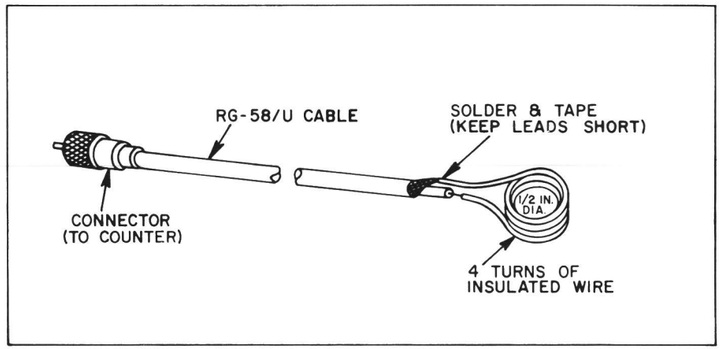



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Figure 7 - Coaxial Cable and Test Loop

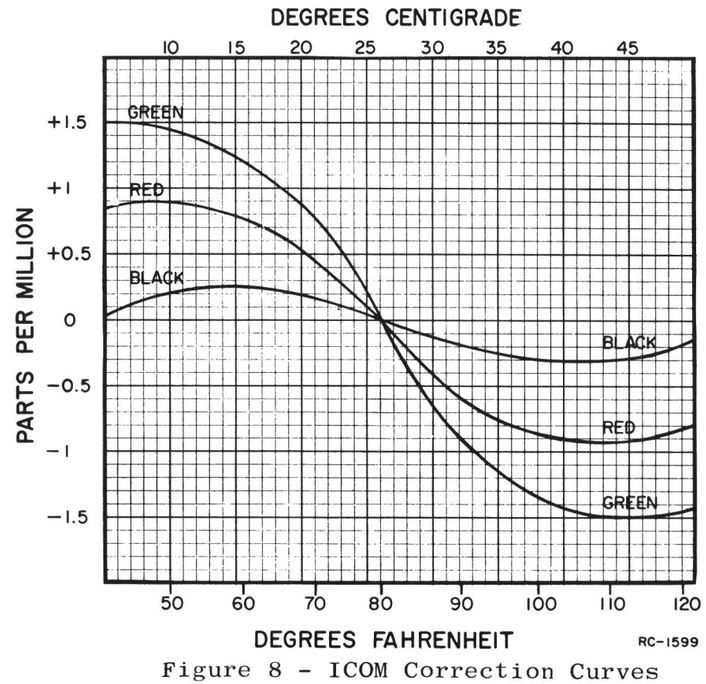



Figure 8 - ICOM Correction Curves

# DUAL FRONT END ALIGNMENT

Refer to Receiver MAINTENANCE MANUAL for Receiver IF Alignment Procedure.

## EQUIPMENT REQUIRED

1. GE Test Set Models 4EX3A10 or 4EX8K11 (or a 20,000 ohm-per-volt multimeter).

2. Signal Generator (450-470 MHz range). Connect a one-inch piece of insulated wire no larger than .065-inch diameter to generator output probe.

## PRELIMINARY CHECKS AND ADJUSTMENTS

1. Plug Test Set cable into metering jack J2352. With Test Set in position J, check for regulated +10 Volts. If using multimeter, measure at metering jack J2352-13 and -16.

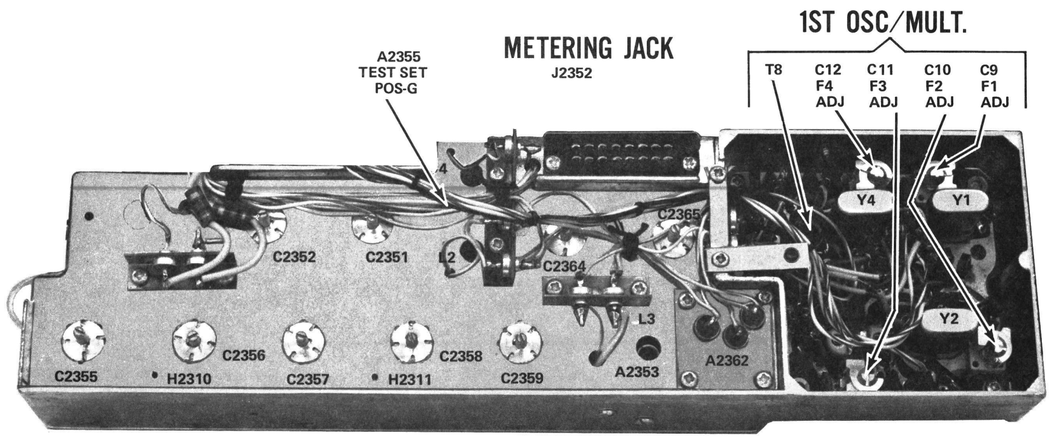
2. If using Multimeter for alignment, connect positive lead to J2352-16 (ground).

3. Set the frequency selector switch on the control unit to select the center frequency of the multi-frequency DFE.

4. For a large change in frequency or a badly mis-aligned DFE, set crystal trimmers C9, C10, C11 and C12 on standard 1st Osc/Mult board to mid-capacity. Do not touch ICOM trimmer if using ICOM oscillator.

NOTE

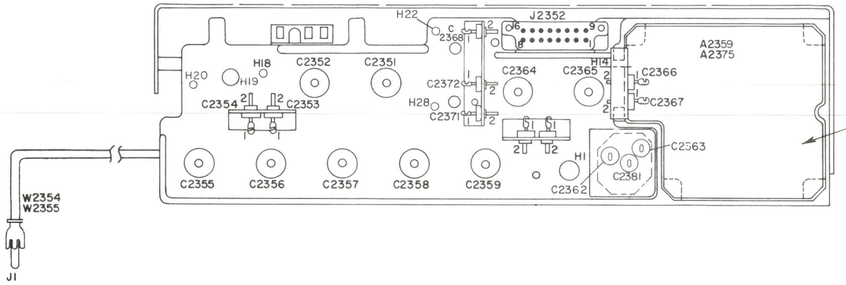
If Receiver and Dual Front End operating frequencies are less than 1 MHz apart, connect the signal generator directly into the Dual Front End antenna connector, not into the connector.




## ALIGNMENT PROCEDURE

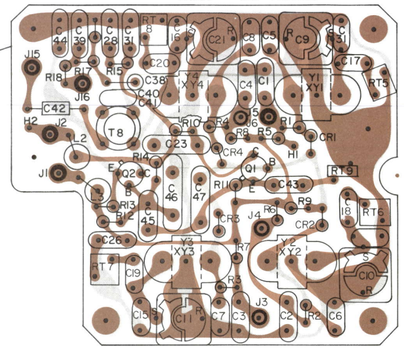
| STEP | METERING POSITION: GE Test Set | METERING POSITION: Multimeter Minus at J2352 | TUNING CONTROL | METER READING | PROCEDURE |
|---|---|---|---|---|---|
| | OSCILLATOR AND MULTIPLIERS AND 1ST MIXER | | | | |
| 1 | D (MULT-1 on DFE) | Pin 4 | T8 (on 1st OSC/MULT) (L5 on ICOM version) | Maximum | Tune T8 or L5 for maximum meter reading. |
| 2 | D (MULT-1 on DFE) | Pin 4 | L1 (on MULT Bd) | Minimum | Tune L1 for minimum meter reading. |
| 3 | G (MULT-2 on DFE) | Pin 1 | T8 or L5 (on 1st OSC/MULT) L1 and L2 (on MULT Bd) | Maximum | Tune T8 or L5, L1 and L2 for maximum meter reading. If two peaks occur, use the peak that occurs with the slug nearest the top of the coil form. |
| 4 | G (MULT-2 on DFE) | Pin 1 | C2364 | Minimum | Tune C2364 for a small dip in in meter reading. |
| 5 | A (DISC on Receiver) | Pin 10 | | Zero | Connect Test Set plug to receiver metering jack J442. Insert signal generator probe into H2311 and adjust signal generator for discriminator zero. |
| 6 | B (2nd IF Amp on Receiver) | Pin 2 | T4, C2364 and C2365 | Maximum | Tune T4, C2364 and C2365 for maximum meter reading. |
| 7 | B (2nd IF Amp on Receiver) | Pin 2 | L3 (on 1st Mixer) | Maximum | Apply an on-frequency signal as above. Tune L3 for maximum meter reading, keeping signal below saturation. If two peaks occur, use the peak that occurs with the slug nearest the bottom of the coil form. |
| | RF CIRCUITS | | | | |
| 8 | B (2nd IF Amp on Receiver) | Pin 2 | A2353—L3, C2359, C2358, C2357, & C2356 | Maximum | Apply an on-frequency signal into holes as shown below. Insert probe into hole only deep enough to obtain a reading.<br>Insert Probe In: — Tune:<br>1. H2311 — A2353-L3, C2359 and C2358<br>2. H2310 — C2356, C2357 and C2358 |
| 9 | B (2nd IF Amp on Receiver) | Pin 2 | C2355, C2356, C2357, C2358, C2359 and A2353-L3 | See Procedure | For standard models, apply an on-frequency signal to the antenna jack (J1) and tune C2355 for maximum meter reading. Then retune C2356 thru C2359 and A2353-L3 for best sensitivity. |
| 10 | B (2nd IF Amp on Receiver) | Pin 2 | C2351, C2352, C2355 thru C2359 and A2353-L3 | See Procedure | For models with UHS, apply an on-frequency signal to the antenna jack (J1) and tune C2351 and C2352 for maximum meter reading. Then retune C2351, C2352, C2355 thru C2359 and A2353-L3 for best sensitivity. |
| | FREQUENCY ADJUSTMENT | | | | |
| 11 | A (DISC 2nd IF Amp on Receiver | Pin 10 | C9 on 1st OSC/MULT (C10, C11 and C12 for multi-frequency) | Zero | Apply a 10 μV or greater on-frequency signal to the antenna jack, and adjust C9 for zero discriminator reading. In multi-frequency units, tune C10, C11 or C12 as required.<br>——NOTE——<br>For proper frequency control of the receiver, it is recommended that all frequency adjustments be made when the equipment is at a temperature of approximately 75°F. In no case should frequency adjustments be made when the equipment is outside the temperature range of 50° to 90°F. |

TOP VIEW




1ST OSCILLATOR/MULTIPLIER

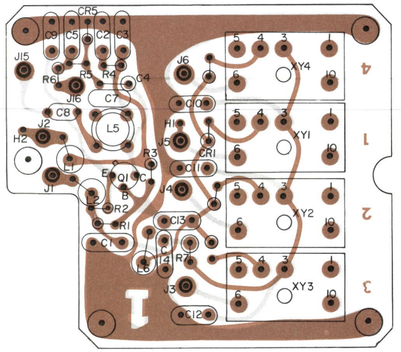
A2359 450-470MHZ



(19B204934, Sh. 1, Rev. 1)
(19B204934, Sh. 2, Rev. 1)

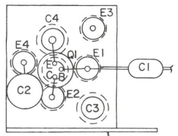
1ST OSCILLATOR/MULTIPLIER (WITH ICOM)

A2375

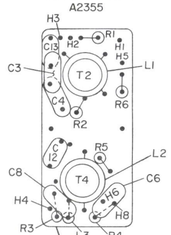


(19B216041, Sh. 1, Rev. 2)
(19B216041, Sh. 2, Rev. 2)

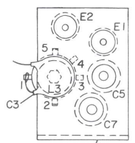
RF AMPLIFIER
A2352
(U.H.S MODEL ONLY)



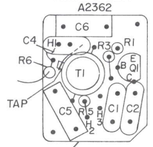
MULTIPLIER
A2355



1ST MIXER
A2353

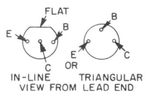


HI IF AMPLIFIER
A2362

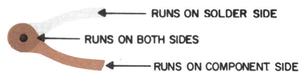


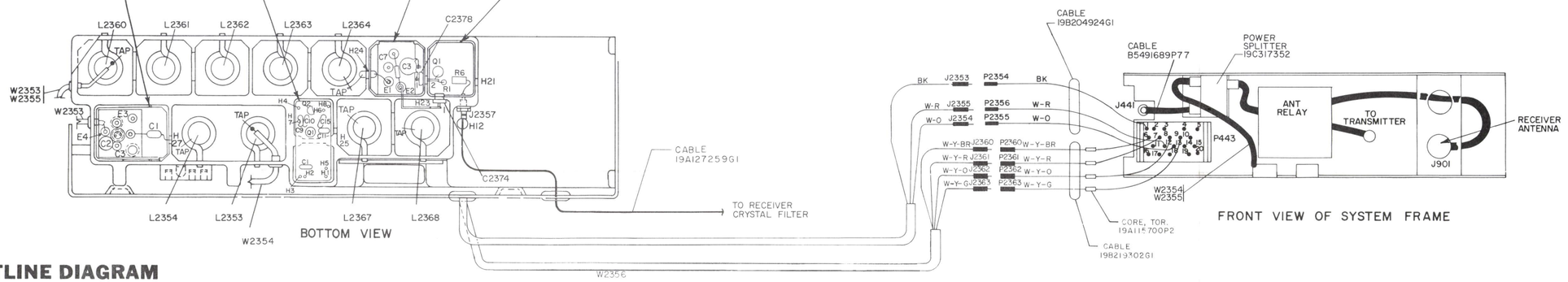
FET LEAD IDENTIFICATION FOR QI OF A2352 & A2353

TRANSISTOR LEAD IDENTIFICATION




NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.







FRONT VIEW OF SYSTEM FRAME

(19R621385, Rev. 5)

## OUTLINE DIAGRAM

450—470 MHZ, DUAL FRONT END
19D413487G1 & G2

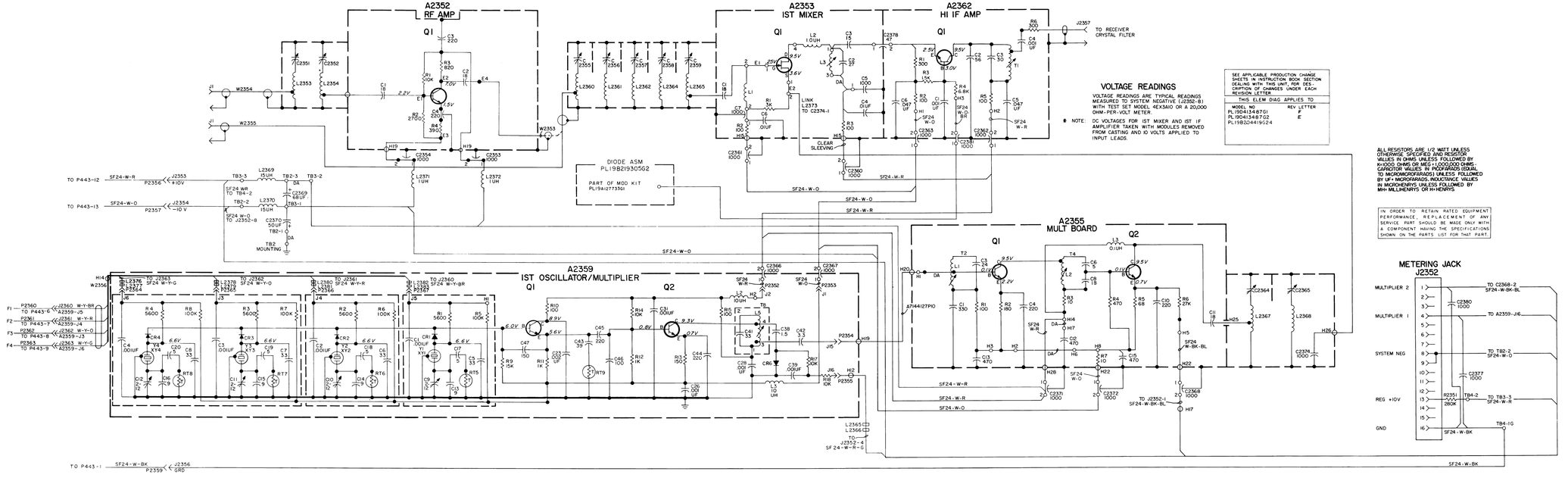
## PARTS LIST

LBI4249C

450-470 MHz DUAL FRONT END
19D413487G1, G2

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| A2352* | | RF AMPLIFIER 19C320097G1 (Added by REV D) |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 and C2 | 5496218P45 | Ceramic disc: 18 pf ±5%, 500 VDCw, temp coef 0 PPM. |
| C3 | 5493392P105 | Ceramic, stand off: 220 pf +100% -0%, 530 VDCw; sim to Allen-Bradley Type 385D. |
| C4 | 5493392P5 | Ceramic, feed-thru: 220 pf +100% -0%, 500 VDCw; sim to Allen-Bradley Type FA5C. |
| | | - - - - - - - - - - TERMINALS - - - - - - - - - - |
| E1 and E2 | 19B209055P8 | Terminal, feed thru: sim to Electrical Industries ABA5-404S5. |
| E3 | 19B209055P1 | Terminal, feed thru: sim to Electrical Industries ABA5-404-4A5. |
| E4 | 19B209055P8 | Terminal, feed thru: sim to Electrical Industries ABA5-404S5. |
| | | - - - - - - - - - - TRANSISTORS - - - - - - - - - - |
| Q1 | 19A116859P1 | Silicon, NPN; sim to Type 2N5032 or 2N5370. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 | 3R152P103J | Composition: 1K ohms ±5%, 1/4 w. |
| R2 | 3R152P272J | Composition: 2.7K ohms ±5%, 1/4 w. |
| R3 | 3R152P821J | Composition: 820 ohms ±5%, 1/4 w. |
| R4 | 3R152P391J | Composition: 390 ohms ±5%, 1/4 w. |
| A2352* | | RF AMPLIFIER 19C311785G1 (Is REV C and earlier) |
| | | - - - - - - - - - - CAPACITORS - - - - - - - - - - |
| C1 | 19A116114P43 | Ceramic: 27 pf ±10%, 100 VDCw; temp coef 0 PPM. |
| C2 | 5496218P245 | Ceramic disc: 18 pf ±5%, 500 VDCw, temp coef 0 PPM. |
| C3 | 5493392P5 | Ceramic, feed-thru: 220 pf +100% -0%, 500 VDCw; sim to Allen-Bradley Type FA5C. |
| C4 thru C6 | 5493392P107 | Ceramic, stand-off: 1000 pf +100% -0%, 500 VDCw; sim to Allen-Bradley Type 385D. |
| | | - - - - - - - - - - TERMINALS - - - - - - - - - - |
| E1 and E2 | 19B209055P8 | Terminal, feed thru: sim to Electrical Industries ABA5-404S5. |
| E3 | 19B209055P1 | Terminal, feed thru: sim to Electrical Industries ABA5-404-4A5. |
| | | - - - - - - - - - - INDUCTORS - - - - - - - - - - |
| L1 and L2 | 19B209420P1 | Coil, RF: 0.10 uh ±5%, 0.08 ohms DC res max; sim to Jeffers 4615-12. |
| L3 thru L6 | 19A116632P1 | Toroidal core. |
| | | - - - - - - - - - - TRANSISTORS - - - - - - - - - - |
| Q1 | 19A116154P1 | N Channel, field effect. |
| | | - - - - - - - - - - RESISTORS - - - - - - - - - - |
| R1 and R2 | 3R152P101K | Composition: 100 ohms ±10%, 1/4 w. |

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



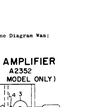

# SCHEMATIC DIAGRAM

## 450—470 MHz, DUAL FRONT END WITH STANDARD OSCILLATOR 19D413487G1 AND G2

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| A2353 | | **FIRST MIXER ASSEMBLY 19C311976G1** |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C1 | 5496218P312 | Ceramic disc: 18 pf ±10%, 500 VDCW, temp coef -1530 PPM. |
| C2 | | (Part of L3). |
| C3 | 5496218P344 | Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -1530 PPM. |
| C4 | 19A116080P1 | Polyester: 0.01 µf ±20%, 50 VDCW. |
| C5 | 5493392P107 | Ceramic, stand-off: 1000 pf -100% -0%, 500 VDCW; sim to Allen-Bradley Type 5053U. |
| C6 | 19A116080P1 | Polyester: 0.01 µf ±20%, 50 VDCW. |
| C7 | 5493392P7 | Ceramic, feed-thru: 1000 pf -100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C. |
| C8 | | (Part of L3). |
| | | - - - - - - - - - TERMINALS - - - - - - - - - |
| E1 and E2 | 19B209055P8 | Terminal, feed thru: sim to Electrical Industries AR40-4045S. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L1 | 19A127430G1 | Choke. |
| L2 | | (Part of L3). |
| L3 | 19B216440G1 | Coil assembly, includes: |
| C2 | 5436218P249 | Capacitor, ceramic disc: 27 pf ±5%, 500 VDCW, temp coef -80 PPM. |
| C9 | 19A114114P12 | Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM. |
| L2 | 19B209420P113 | Coil, RF: 1.8 µh ±10%, 0.74 ohms DC res max; sim to Jeffers 4424-8K. |
| T4 | 5493798P8 | Tuning slug. |
| | | COIL ASSEMBLY 19B216374G2 |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C6 | 5496218P237 | Ceramic disc: 6.0 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM. |
| C8 | 5496218P246 | Ceramic disc: 20 pf ±5%, 500 VDCW, temp coef -80 PPM. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L2 | 19B216374P7 | Coil. |
| T4 | 5493798P7 | Tuning slug. |
| A2359 | | **FIRST OSCILLATOR/MULTIPLIER 19B209419G24** |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C1 thru C4 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C5 thru C8 | 5496219P151 | Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -750 PPM. |
| C9 | 5491271P106 | Variable, subminature: approx 2.1-12.7 pf, 750 v peak; sim to EF Johnson 189. |
| C13 thru C16 | 5496219P40 | Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM. |
| C17 thru C20 | 19C300685P93 | Ceramic disc: 5 pf ±0.1 pf, 500 VDCW, temp -3300 PPM. |
| C21 | 5494681P114 | Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C26 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C28 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C31 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. |
| C38 | 5491601P123 | Molded: 1.5 pf ±5%, 500 VDCW; sim to Quality Components Type MC. |
| L3 | 19B209420P1 | Coil, RF: 0.10 µh ±5%, 0.08 ohms DC res max; sim to Jeffers 4418-1J. |
| C41 | | (Part of T8). |
| C42 | 5491601P130 | Molded: 3.3 pf ±5%, 500 VDCW; sim to Quality Components Type MC. |
| C43 | 5496218P53 | Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef 0 PPM. |
| C44 | 5490008P135 | Silver mica: 220 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C45 | 5490008P35 | Silver mica: 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C46 | 5496219P663 | Ceramic disc: 100 pf ±5%, 500 VDCW, temp coef -330 PPM. |
| C47 | 5496219P767 | Ceramic disc: 150 pf ±5%, 500 VDCW, temp coef -750 PPM. |
| | | - - - - - - - - - DIODES AND RECTIFIERS - - - - - - - |
| CR1 thru CR6 | 19A115603P1 | Silicon. |
| CR6 | 19A115250P1 | Silicon. |
| | | - - - - - - - - - JACKS AND RECEPTACLES - - - - - - - |
| J1 thru J6 | 4033513P4 | Contact, electrical: sim to Bead Chain L83-3. |
| J15 and J16 | 4033513P4 | Contact, electrical: sim to Bead Chain L83-3. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L2 and L3 | 7488079P916 | Choke, RF: 10 µh ±10% ind at 640 ma, 0.6 ohm DC res; sim to Jeffers 4431-7K. |
| L5 | | (Part of T8). |
| | | - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q1 and Q2 | 19A115330P1 | Silicon, NPN. |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R1 thru R4 | 3815299G62J | Composition: 5600 ohms ±5%, 1/4 w. |
| R5 thru R8 | 3815291046K | Composition: 0.10 megohm ±10%, 1/4 w. |
| R9 | 3815291533J | Composition: 15,000 ohms ±5%, 1/4 w. |
| R10 | 3815291015K | Composition: 100 ohms ±10%, 1/4 w. |
| R11 and R12 | 3815291032J | Composition: 1000 ohms ±5%, 1/4 w. |
| R13 | 3815291551J | Composition: 150 ohms ±5%, 1/4 w. |
| R14 | 3815291033J | Composition: 10,000 ohms ±5%, 1/4 w. |
| R15 | 3815291015K | Composition: 100 ohms ±10%, 1/4 w. |
| R17 and R18 | 3815291033K | Composition: 10,000 ohms ±10%, 1/4 w. |
| | | - - - - - - - - - TRANSFORMERS - - - - - - - - - |
| RT5 thru RT8 | 19B209284P7 | Disc: 62 ohms res nominal at 25°C, color code violet. |
| RT9 | 19B209284P8 | Disc: 945 ohms res nominal at 25°C, color code gray. |
| T8 | | COIL ASSEMBLY 19B204950G2 |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C41 | 5496218P251 | Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM. |
| L5 | 19A121728P1 | Coil. |
| | 5493798P7 | Tuning slug. |
| | | - - - - - - - - - SOCKETS - - - - - - - - - |
| | | (Refer to Mechanical Parts). |
| XY1 thru XY4 | | |
| | | - - - - - - - - - CRYSTALS - - - - - - - - - |
| | | NOTE: When reordering give GE Part Number and specify exact freq needed. |
| | | Crystal freq = (QF -12.4 MHz) 24 |
| Y1 thru Y5 | 19B206576P7 | Quartz: freq range 17925.001 to 20685.000 KHz, temp range -30°C to +85°C. (450-470 MHz) |
| A2362 | | **IF AMPLIFIER ASSEMBLY 19B216335G1** |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C1 | 19A116655P19 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C2 | 7489162P21 | Silver mica: 56 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C3 | 5496218P650 | Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -470 PPM. |
| C4 | 5494681P11 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C5 and C6 | 19A116080P5 | Polyester: 0.047 µf ±5%, 50 VDCW. |
| | | - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q1* | 19A115440P1 | Silicon, NPN. |
| | | In REV A and earlier: |
| | 19A115328P1 | Silicon, NPN. |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R1 | 3815291033J | Composition: 300 ohms ±5%, 1/4 w. |
| R2 | 3815291015K | Composition: 100 ohms ±10%, 1/4 w. |
| R3* | 3815291532J | Composition: 1.5K ohms ±5%, 1/4 w. |
| | | In REV B & earlier: |
| | 3815291002J | Composition: 3K ohms ±5%, 1/4 w. |
| R4 | 3815291682J | Composition: 6.8K ohms ±5%, 1/4 w. |
| R5 | 3815291015K | Composition: 100 ohms ±10%, 1/4 w. |
| R6 | 3815291301J | Composition: 300 ohms ±5%, 1/4 w. |
| | | - - - - - - - - - TRANSFORMERS - - - - - - - - - |
| T1 | 19B216372G1 | Coil assembly. Includes: |
| | 5493798P7 | Tuning slug. |
| A2375 | | **FIRST OSCILLATOR/MULTIPLIER 19C311733G4** |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C1 thru C3 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap. |
| C4 | 5491601P123 | Phenolic: 1.5 pf ±5%, 500 VDCW; sim to Quality Components Type MC. |
| C5 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap. |
| C7 | | (Part of T2). |
| C8 | 5496219P238 | Ceramic disc: 7 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM. |
| C9 | 5490008P135 | Silver mica: 220 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15. |
| C10 thru C12 | 5494681P112 | Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap. |
| CR1 thru CR4 | 19A115250P1 | Silicon. |
| | | - - - - - - - - - DIODES AND RECTIFIERS - - - - - - - |
| CR5 thru CR8 | 5496267P11 | Tantalum: 68 pf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| J1 thru J5 | 4033513P4 | Contact, electrical: sim to Bead Chain L83-3. |
| J15 and J16 | 4033513P4 | Contact, electrical: sim to Bead Chain L83-3. |
| L1 and L2 | 7488079P916 | Choke, RF: 10 µh ±10%, 0.6 ohm DC res max; sim to Jeffers 4431-7K. |
| L5 | | (Part of T2). |
| L6 | 7488079P55 | Choke, RF: 2.20 µh ±10%, 0.50 ohms DC res max; sim to Jeffers 4412-8K. |
| | | - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q1* | 19A115440P1 | Silicon, NPN. |
| | | In REV A and earlier: |
| | 19A115330P1 | Silicon, NPN. |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R1 | 3815291032J | Composition: 1000 ohms ±5%, 1/4 w. |
| R2 | 3815291512J | Composition: 150 ohms ±5%, 1/4 w. |
| R3 | 3815291033J | Composition: 10,000 ohms ±5%, 1/4 w. |
| R4 | 3815291001K | Composition: 100 ohms ±10%, 1/4 w. |
| R5 and R6 | 3815291033K | Composition: 10,000 ohms ±10%, 1/4 w. |
| R7 | 3877P272K | Composition: 2700 ohms ±10%, 1/2 w. |
| | | - - - - - - - - - TRANSFORMERS - - - - - - - - - |
| T2 | | COIL ASSEMBLY 19B204950G2 |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C7 | 5496218P251 | Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L5 | 19A121728P1 | Coil. Includes: |
| | 5491798P7 | Tuning slug. |
| | | - - - - - - - - - SOCKETS - - - - - - - - - |
| XY1 thru XY4 | 19B216043G1 | Socket, 6 contacts, (ICOM). |
| | | **OSCILLATORS** |
| | | NOTE: When reordering specify ICOM Frequency. ICOM Freq = Operating Freq -12.4 MHz - 24. |
| Y1 thru Y4 | 6EGZ6A10 | Integrated Circuit Oscillator Module (ICOM). |
| | 19D413070P1 | Cap, decorative. |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C2351 and C2352 | | (See Miscellaneous). |
| C2353 thru C2354 | 5493392P7 | Ceramic, feed-thru: 1000 pf ±100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| C2355 thru C2359 | | (See Miscellaneous). |
| C2360 thru C2363 | 5493392P7 | Ceramic, feed-thru: 1000 pf ±100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| C2364 and C2365 | | (See Miscellaneous). |
| C2366 thru C2368 | 5493392P7 | Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| C2369 | 5496267P11 | Tantalum: 68 pf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| C2370 | 19A115680P4 | Electrolytic: 50 pf +150% -10%, 25 VDCW; sim to Mallory Type TT. |
| C2371 and C2372 | 5493392P7 | Ceramic, feed-thru: .001 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| C2374 | 5493392P107 | Ceramic, stand-off: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type 5053. |
| C2377 | 777475P4 | Ceramic disc: .001 pf +100% -0%, 500 VDCW. |
| C2378 | 5493392P3 | Ceramic, feed-thru: 47 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| C2380 | 5494481P11 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C2381 | 5493392P7 | Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C. |
| | | - - - - - - - - - JACKS AND RECEPTACLES - - - - - - |
| J2352 | 19B205689G2 | Connector: 18 contacts rated at 5 amps min at 1000 VDC max. |
| J2353 and J2354 | 7147199P1 | Connector: male contact; sim to Winchester Electronics 21803. |
| J2356 | 7147199P1 | Connector: male contact: sim to Winchester Electronics 21803. |
| J2357 | 19A115465P1 | Connector, coaxial: sim to Micro Electronics Type 1104. |
| J2360 thru J2363 | | (Part of W2356). |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L2353 | 19B204938G6 | Coil. |
| L2354 | 19B204938G16 | Coil. |
| L2360 | 19B204938G12 | Coil. |
| L2361 thru L2363 | 19B204936P14 | Coil. |
| L2364 | 19B204938G18 | Coil. |
| L2365 and L2366 | 19A115700P2 | Toroidal core. |
| L2367 | 19B204936G20 | Coil. |
| L2368 | 19B204936G16 | Coil. |
| L2369 and L2370 | 7488079P18 | Choke, RF: 15 µh ±10%, 1.3 ohms DC res; sim to Jeffers 4421-8K. |
| L2371 and L2372 | 7488079P6 | Choke, RF: 1.0 µh ±10%, 0.30 ohms DC res; sim to Jeffers 4411-8K. |
| L2373 | 19A124733P1 | Coil. |
| L2375 thru L2383 | | (Part of W2356). |
| | | - - - - - - - - - PLUGS - - - - - - - - - |
| P2351 and P2355 | 4029840P2 | Contact, electrical: sim to Amp 42827-2. |
| P2364 thru P2367 | | (Part of W2356). |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R2351 | 19A116278P446 | Metal film: 0.28 megohm ±2%, 1/2 w. |
| | | - - - - - - - - - TERMINAL BOARDS - - - - - - - - - |
| TB1 | 7487424P2 | Miniature, phen: 1 terminal. |
| TB2 and TB3 | 7487424P24 | Miniature, phen: 3 terminals. |
| TB4 | 7487424P23 | Miniature, phen: 1 terminal. |
| | | - - - - - - - - - CABLES - - - - - - - - - |
| W2353 | 19A122550G1 | RF: approx 4 inches long. |
| W2354 | 19A122563G1 | RF: approx 27 inches. |
| W2355 | 19A122563G2 | RF: approx 21 inches. |
| W2356 | | **CABLE ASSEMBLY 19B219304G2** |
| | | - - - - - - - - - JACKS AND RECEPTACLES - - - - - |
| J2360 thru J2363 | 7147199P1 | Connector: male contact; sim to Winchester Electronics 21803. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L2376 thru L2383 | 19A115700P2 | Toroidal core. |
| | | - - - - - - - - - PLUGS - - - - - - - - - |
| P2364 thru P2367 | 4029840P2 | Contact, electrical: sim to Amp 42827-2. |
| | | **RECEIVER MODIFICATION KIT 19A127733G1** |
| | | **DIODE ASSEMBLY 19B219302G2** |
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C1 | 5493392P107 | Ceramic, stand off: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type 5053. |
| | | - - - - - - - - - DIODES AND RECTIFIERS - - - - - - |
| CR2 thru CR3 | 19A115250P1 | Silicon. |
| | | - - - - - - - - - MISCELLANEOUS - - - - - - - - - |
| | 19C317352G1 | Power Splitter. |
| | 3815291033K | Resistor, composition: 10,000 ohms ±10%, 1/4 w. |
| | 19A115700P2 | Bead, choke: sim to Fair-Rite 26J707. (Used with 19B219302G2 cable, C2361 and C2411-13). |
| | 19A127259G1 | Cable, (Connects to Receiver Crystal Filter). |
| | 19B219302G1 | Cable: 4 conductor, (Located between Dual Front End and P443). |
| | 19B204924G1 | Cable: 3 conductor, (Located between Dual Front End and P443). |
| | 5491698P77 | RF Cable, (Located between Power Separator and J441). |
| | 5490407P9 | Grommet, rubber, (Used with 19A127259G1 cable). |
| | 4037914P2 | Pad, (Located on Power Supply cover). |
| | 19B201074P204 | Tag screw, Phillips PANSHEW: No. 4-40 x 1/4, (Secures Oscillator Board). |
| | 19A115533P9 | Tag screw: No. 6-32 x 1/4, (Secures Dual Front End and Rear cover). |
| | 4029840P1 | Contact, electrical: sim to AMP 41454. |
| | 4033349P1 | Contact, electrical: sim to Bead Chain W125-34. (Used with Diode Assembly). |
| | 19A129072P2 | Plate, (Used with Diode Assembly). |
| | | **MISCELLANEOUS** |
| | 19B204913P1 | Shield. (Used with TB4). |
| | 19B204940P1 | Plate, aluminum. (Located over RF Circuit). |

Outline Diagram Was:

RF AMPLIFIER A2352 (U.H.S MODEL ONLY)




## PRODUCTION CHANGES

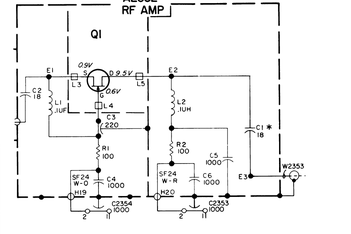
Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A & B – Model 19D413498G1, G2
Incorporated into initial shipment.

REV. C – Model 19D413498G1, G2
To improve receiver intermodulation performance. Changed Q3 and R3 on IF Amplifier assembly 19B216361.

REV. D – Model 19D413498G1
To incorporate improved design. Replaced existing RF Amplifier assembly 19B216335G1 (19C317950G1) with a new RF Amplifier Assembly (19C320897G1).

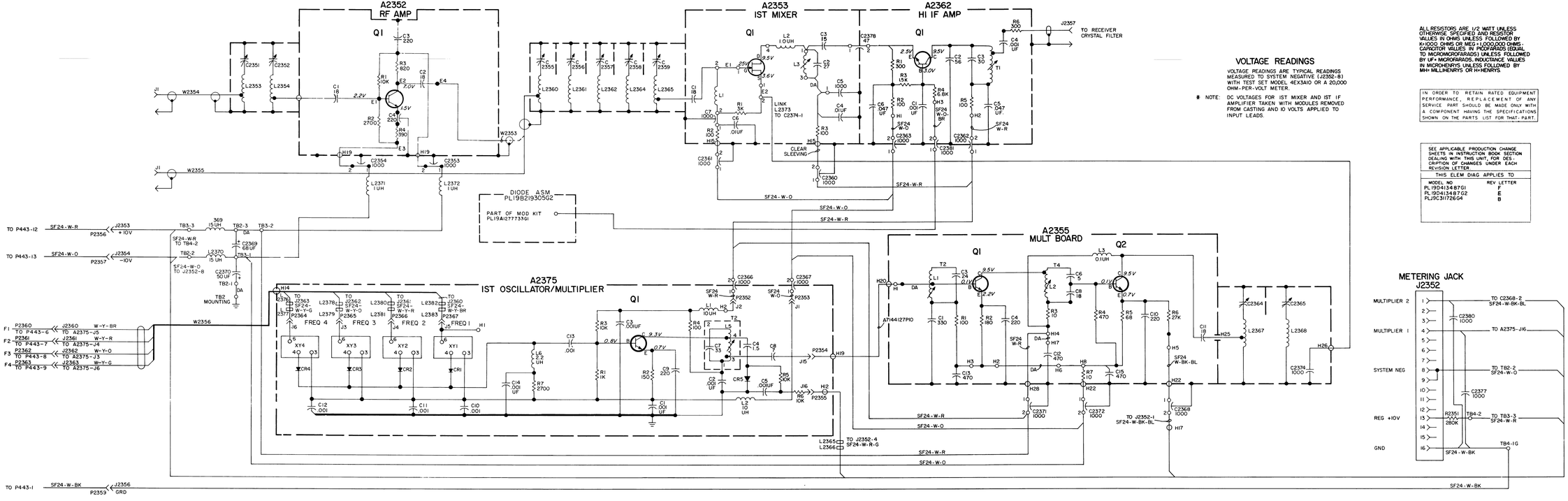
Schematic Diagram 19B621327 & 19B621328 Was:




* In some units C1 may be 27 pf

REV. E – Model 19D413498G1
REV. D – Model 19D413498G2
To improve receiver sensitivity. Changed A2353-C1 & A2352-C3

REV. F – Model 19D413498G1
REV. E – Model 19D413498G2
To incorporate new transistor. Changed Q3.




## VOLTAGE READINGS

VOLTAGE READINGS ARE TYPICAL READINGS MEASURED TO SYSTEM NEGATIVE (J2352-8) WITH TEST SET MODEL 4EX3AIO OR A 20,000 OHM-PER-VOLT METER.

* NOTE: DC VOLTAGES FOR IST MIXER AND IST IF AMPLIFIER TAKEN WITH MODULES REMOVED FROM CASTING AND 10 VOLTS APPLIED TO INPUT LEADS.

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED. K AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG =1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF = MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO

| MODEL NO | REV LETTER |
|---|---|
| PL19041348TG1 | F |
| PL19041348TG2 | E |
| PLJSC3117264 | B |

(198621328, Rev. 12)

## SCHEMATIC DIAGRAM

450—470 MHZ, DUAL FRONT END WITH ICOM OSCILLATOR
19D413487G1 & G2