Figure 26. Radio Transmitter T-195/GRC-19, composite block diagram.
Figure 30. Power-amplifier and clamper stages.
NOTES:
1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS, CAPACITORS ARE IN UUF.
2. S606 IS SHOWN IN OFF POSITION.
3. S607 IS SHOWN IN PA GRID POSITION.
4. K605 AND K615 ARE ENERGIZED WHEN KEY OR MICROPHONE SWITCH IS CLOSED.
5. S201B IS SHOWN POSITIONED FOR 1.5-1.7 MC RANGE.
Figure 31. Power-amplifier plate circuit, functional diagram.
NOTES:
1. UNLESS OTHERWISE SHOWN,
   CAPACITORS ARE IN UUF.
2. [BAND SELECTOR] IS
   POSITIONED FOR OPERATION
   IN THE 1.5 TO 1.7 MG RANGE
   (BAND I).

TO JUNCTION OF R 211 AND R 231
ON POWER AMPLIFIER SUBCHASSIS
TO
SERVO MOTOR B201
Figure 44. Homing cycle flow chart.

1. Band selector is rotated from 1.5 to 1.7-MG range, to the 4 to 6-MG range.
2. A momentary ground path is established through S203 and the homing switches to Term.10 of K616.
3. Relay K616 is energized.
   - An alternate ground path to K616 is established through contacts 5 and 6 of K616, 4 and 7 of S101B (front) and 10 and 8 of S101E (front).
   - An alternate ground path to K616 is established through contacts 5 and 6 of K616 and 3 and 2 of S1003.
   - Test key S603 is closed by the operator. K613 becomes energized, S614 rotates until open circuit is found whereupon K613 is de-energized.
   - 24V is applied to K604 and B1102 through contacts 4 and 3 of K616 and 2 and 3 of K617.
   - B1101 is disabled, B1102 is rotated in first direction.
   - L1101 and S1101 are rotated in first direction.
   - L1101 and S1101 continue to rotate.
   - When S1101 reaches limit (at minimum inductance), S1101 frontgrounds Term 1 of K617 through its own contacts and contacts 2 and 4 of S1101A (rear).
3. Relay K617 is energized.
   - Positivity of voltage to B1102 leads is reversed; 24V through contacts 7 and 8 of K617, ground through holding contacts 5 and 6 of K617 and S1101A (rear).
   - Motor B1102 reverses.
   - Ground path is established through holding contacts 5 and 6 of K617 and S1101A (rear).
   - Servo motor B1101 is "stalled". Antenna tuning capacitor is now "homed".
NOTES:
1. UNLESS OTHERWISE SHOWN
   CAPACITORS ARE IN UUF
2. SI001 REMAINS OPEN UNTIL SI002 IS
   DRIVEN TO MAXIMUM CAPACITANCE STOP.
3. SI002 AND SI003 ARE SHOWN
   IN THE "HOME" POSITION.
4. SEE 24V DISTRIBUTION.
5. SW04 IS SHOWN IN [VOICE/FSK] POSITION.
6. SI01E IS SHOWN POSITIONED FOR
   OPERATION IN THE 1.5 TO 1.7 MC BAND.
   DOTTED LINE INDICATES SWITCH POSITION
   FOR OPERATION IN 4 TO 6 MC BAND.
7. K609 IS ENERGIZED DURING AUTOTUNE
   CYCLE ONLY.
8. ENERGIZED UNTIL OUTPUT CAPACITOR IS
   SELECTED.

5. Homing circuits, functional diagram.
NOTES:

1. UNLESS OTHERWISE SHOWN
   CAPACITORS ARE IN UHF
2. S1001 REMAINS OPEN UNTIL S1002 IS
   DRIVEN TO MAXIMUM CAPACITANCE STOP.
3. S1002 AND S1003 ARE SHOWN
   IN THE "HOME" POSITION.
4. SEE 24V DISTRIBUTION.
5. SW1 IS SHOWN IN "VOICE/TEX" POSITION.
6. S104 IS SHOWN POSITIONED FOR
   OPERATION IN THE 1.5 TO 1.7 MC BAND,
   DOTTED LINE INDICATES SWITCH POSITION
   FOR OPERATION IN 4 TO 6 MC BAND.
7. K609 IS ENERGIZED DURING AUTOTUNE
   CYCLE ONLY.
8. ENERGIZED UNTIL OUTPUT CAPACITOR IS
   SELECTED.
NOTES:
1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS;
   CAPACITORS ARE IN UUF.
2. K609 IS ENERGIZED DURING AUTOTUNE CYCLE.
3. SHOWN IN OFF POSITION.
4. SHOWN POSITIONED FOR 1.5-1.7 MC RANGE.

Figure 52. Output Filter Assembly
Figure 52. Output capacitor, functional diagram.
NOTES:

1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS, CAPACITORS ARE IN UUF.

2. S602 IS SHOWN IN RELAY POSITION.
Figure 54. Antenna switch and keying circuits, functional diagram.
Figure 55. Autotune control circuits, function
NOTES:
1. S606 is shown in **OFF** position.
2. S604 is shown in [ ] (manual) position.
3. See +24-Volt distribution.
4. Unless otherwise shown, capacitors are in UUF.
Figure 57. Multiturn positioning head, re...
FROM AUTOTUNE
MOTOR B601

FROM AUTOTUNE
MOTOR B601

WORM GEAR

TO MASTER OSCILLATOR
AND EXCITER TUNING CORES

NOTE:
THIS IS A REPRESENTATIVE DRAWING.
PARTS ARE NOT NECESSARILY DRAWN
TO SCALE.

TM 806-54

390412 O-56 (In pocket) No. 9
Figure 58. Autotune circuits, flow chart.
Figure 61. +24-volt distribution, functional diagram.
Figure 63. +250-volt distribution, function diagram.
1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS, CAPACITORS ARE IN UF.

2. K402 IS ENERGIZED IN VOICE/FSK OPERATION.
1. Unless otherwise shown, resistances are in ohms and pin to ground with a 20 turn resistor and with the subchassis pins to main frame. Voltages are DC and are read to ground with a Vv mm to main frame, using the rear terminals.

2. NC indicates no connection.

3. ∞ indicates infinity.

4. Unless otherwise noted, all resistance measurements are at [OFF], and the band switch at 18,000 mc as shown on the panel. All voltage measurements are set as follows: [DIAL DIM] at [44], [RELAY-NORMAL-DOWN] at [50].

5. This measurement taken with master oscillator subchassis.

6. All tubes in each subchassis.
NOTES:

1. UNLESS OTHERWISE SHOWN, resistances are in ohms and are measured from socket pin to ground with a 20,000-ohms-per-volt meter and with the subchassis plugs disconnected from the main frame.

VOLTAGES ARE DC AND ARE MEASURED FROM SOCKET PIN TO GROUND WITH A VTVM AND WITH SUBCHASSIS CONNECTED TO MAIN FRAME, USING THE REQUIRED BENCH-TEST CABLE.

2. NC INDICATES NO CONNECTION.

3. ∞ INDICATES INFINITY.

4. UNLESS OTHERWISE NOTED, all resistance measurements are taken with the SERVICE SELECTOR at OFF, and the BAND SELECTOR and TUNING CONTROL set for 18,000 mc as shown on the frequency indicator. All voltage measurements are taken at 18 mc with the control set as follows: DIAL DIM at FULL, TEST KEY at ON, LINE LEVEL at -34, RELAY-NORMAL-DUPLEX at NORMAL, and SERVICE SELECTOR at CW.

5. THIS MEASUREMENT TAKEN WITH TEST KEY at OFF.

6. ALL TUBES IN EACH SUBCHASSIS REMOVED.
POWER AMPLIFIER SUBCHASSIS

POWER AMPLIFIER
V201
4 x 150D
(Not visible without disassembly)

-30.5V (See Note 7)
350K (Base Pin)

(See Note 8)
Figure 105. Radio Transmitter T-195/GRC-19, bottom deck, tube voltage and resistance diagram.
Figure 105. Radio Transmitter T-195/GRC-19, bottom deck, tube voltage and resistance diagram.
NOTES:

1. UNLESS OTHERWISE SHOWN,
   RESISTANCES ARE IN OHMS AND ARE MEASURED FROM SOCKET
   PIN TO GROUND WITH A 20,000-Ohms-Per-Volt Meter,
   AND WITH THE SUBCHASSIS PLUGS DISCONNECTED FROM
   THE MAIN FRAME.
   VOLTAGES ARE DC AND ARE MEASURED FROM SOCKET
   PIN TO GROUND WITH A VTVM AND WITH THE SUBCHASSIS
   CONNECTED TO MAIN FRAME, USING THE REQUIRED
   BENCH-TEST CABLE.

2. NC INDICATES NO CONNECTION.

3. ∞ INDICATES INFINITY.

4. UNLESS OTHERWISE NOTED,
   ALL RESISTANCE MEASUREMENTS ARE TAKEN WITH THE SERVICE SELECTOR
   AT OFF, AND THE BAND SELECTOR AND TUNING CONTROL SET FOR
   18,000 MC AS SHOWN ON THE FREQUENCY INDICATOR
   ALL VOLTAGE MEASUREMENTS ARE TAKEN AT 18 MC WITH THE CONTROLS SET
   AS FOLLOWS: DIAL DIM AT FULL, TEST KEY AT ON, LINE LEVEL
   AT -34, RELAY-NORMAL-DUPEX AT NORMAL, AND SERVICE SELECTOR
   AT CW.

5. THIS MEASUREMENT TAKEN WITH TEST KEY AT OFF.

6. VOLTAGE MEASUREMENT FOR THE MODULATOR SUBCHASSIS ARE MADE WITH
   SERVICE SELECTOR AT VOICE AND NO MODULATION INPUT TO THE TRANSMITTER.

7. THE MEASUREMENTS FOR THE PLATES OF V406 AND V407 ARE TAKEN AT
   TERMINALS 2 AND 1 RESPECTIVELY OF T402

8. MEASUREMENTS FOR SOCKET PINS 2, 5, 7 AND BASE PIN OF V201 ARE TAKEN AT
   TERMINALS E205, E207, E206, AND E208 RESPECTIVELY LOCATED ON SHIELD NEAR
   SOCKET XV201

9. ALL TUBES IN EACH SUBCHASSIS REMOVED.
Figure 115. Disassembly of Autotune control head.
NOTES:

1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS CAPACITORS ARE IN UF

2. SWITCHES ARE SHOWN POSITIONED FOR THE 1.5 TO 1.7 MC RANGE

3. SWITCHES ARE SHOWN AS VIEWED FROM THE REAR OF THE EQUIPMENT SECTIONS DESIGNATED A ARE CLOSED TO THE FRONT PANEL

TO J607 MAIN FRAME

TM806-127

390412 O - 56 (In pocket) No. 18
Power amplifier subchassis, schematic diagram.

Notes:
1. Unless otherwise shown: Resistors are in ohms, capacitors are in uuf.
2. S201 is shown as viewed from rear of equipment and positioned for the 1.5 to 1.7 mc range.
NOTES:
1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS, CAPACITORS ARE IN UF.
2. S201 IS SHOWN AS VIEWED FROM REAR OF EQUIPMENT AND POSITIONED FOR THE 1.5 TO 1.7 MC RANGE.
Figure 138. Subchassis interconnection cabling diagram.
ANTENNA NETWORK SERVO AMPLIFIER

NOTES:
1. FOR FSK OPERATION P601 CONNECTS TO J101; P601 TO J620.
2. PLUGS OR JACKS WITH SQUARE CORNERS ARE MOUNTED ON THE SUBCHASSIS OR MAIN FRAME. PLUGS AND JACKS WITH ROUNDED CORNERS ARE ON CABLE ENDS.
3. WIRE COLOR CODE APPLIES ONLY TO CABLES AND CONNECTORS.
   FIRST NO. - BODY
   SECOND NO. - WIDE TRACE
   THIRD NO. - NARROW TRACE
   1. BROWN
   2. RED
   3. ORANGE
   4. YELLOW
   5. GREEN
   6. BLUE
   7. WHITE
   8. BLACK
   NO CODE NUMBER = BUS WIRE.
   COAX = COAXIAL CABLE.

MAIN FRAME

RECEIVER ANTENNA

REMOTE CONT
J601

TM806-136
390412 0 = 56 (In pocket) No. 22
RADIO TRANSMITTER T-195/GRC-19, SCHEMATIC DIAGRAM (SHEET 1 OF 2).
Figure 139. Radio Transmitter T-195/GRC-19, schematic diagram.
### Receptacle Identification

<table>
<thead>
<tr>
<th>Receptacle</th>
<th>Contact</th>
<th>Function</th>
<th>Receptacle</th>
<th>Contact</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>J601</td>
<td>K</td>
<td>Tuning Indicator</td>
<td>J603</td>
<td>A</td>
<td>600-Ohm Line</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>Microphone</td>
<td></td>
<td>B</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>L-V Dynamotor Start</td>
<td></td>
<td>C</td>
<td>Microphone</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Key or Microphone Switch</td>
<td></td>
<td>E</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>FSK Relay Control</td>
<td></td>
<td>F</td>
<td>Key or Microphone Switch</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>Service Selector SW Control GND</td>
<td></td>
<td>H</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>Service Selector SW Control 4/24V</td>
<td></td>
<td>K</td>
<td>Carrier Control</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>600-Ohm Line</td>
<td>J604</td>
<td>B</td>
<td>Break-In Circuit</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>Autotune Control</td>
<td></td>
<td>C</td>
<td>Microphone</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>Autotune Control</td>
<td></td>
<td>D</td>
<td>+24 V</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>Autotune Control</td>
<td></td>
<td>E</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>Voice Relay</td>
<td></td>
<td>F</td>
<td>Key or Microphone</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>Autotune Control</td>
<td></td>
<td>H</td>
<td>600-Ohm Line</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Ground</td>
<td></td>
<td>K</td>
<td>Carrier Control</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>Filament Start Relay</td>
<td>J605</td>
<td>A</td>
<td>+24 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>+24 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D</td>
<td>Ground</td>
</tr>
</tbody>
</table>
Figure 139. Radio Transmitter T-195/GRC-19, schematic diagram—Continued.
<table>
<thead>
<tr>
<th>RECEPTACLE</th>
<th>CONTACT</th>
<th>FUNCTION</th>
<th>RECEPTACLE</th>
<th>CONTACT</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>J601</td>
<td>K</td>
<td>TUNING INDICATOR</td>
<td>J603</td>
<td>A</td>
<td>600-OMH LINE</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>MICROPHONE</td>
<td></td>
<td>B</td>
<td>GROUND</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>L-V DYNAMOTOR START</td>
<td></td>
<td>C</td>
<td>MICROPHONE</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>KEY OR MICROPHONE SWITCH</td>
<td></td>
<td>E</td>
<td>GROUND</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>FSX RELAY CONTROL</td>
<td></td>
<td>F</td>
<td>KEY OR MICROPHONE SWITCH</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>SERVICE SELECTOR SW CONTROL +24V</td>
<td></td>
<td>H</td>
<td>GROUND</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>SERVICE SELECTOR SW CONTROL GND</td>
<td></td>
<td>K</td>
<td>CARRIER CONTROL</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>600-OMH LINE</td>
<td>J604</td>
<td>B</td>
<td>BREAK-IN CIRCUIT</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>AUTOTUNE CONTROL</td>
<td></td>
<td>C</td>
<td>MICROPHONE</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>AUTOTUNE CONTROL</td>
<td></td>
<td>D</td>
<td>+24V</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>AUTOTUNE CONTROL</td>
<td></td>
<td>E</td>
<td>GROUND</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>VOICE RELAY</td>
<td></td>
<td>F</td>
<td>KEY OR MICROPHONE SWITCH</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>AUTOTUNE CONTROL</td>
<td></td>
<td>H</td>
<td>600-OMH LINE</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>GROUND</td>
<td></td>
<td>K</td>
<td>CARRIER CONTROL</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>FILAMENT START RELAY</td>
<td>J605</td>
<td>A</td>
<td>+24V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B</td>
<td>+24V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>GROUND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D</td>
<td>GROUND</td>
</tr>
</tbody>
</table>

**NOTES:**

1. UNLESS OTHERWISE SHOWN: RESISTORS ARE IN OHMS, CAPACITORS ARE IN UUF.
2. 5602 FRONT AND REAR SECTIONS ARE SEPARATED FOR SCHEMATIC PURPOSES.
3. ALL SWITCHES ARE VIEWED FROM THE REAR OF THE EQUIPMENT. SECTIONS DESIGNATED A ARE CLOSEST TO THE FRONT PANEL.
4. ALL SWITCHES ARE SHOWN IN THEIR OFF OR COUNTERCLOCKWISE POSITION, AS VIEWED FROM THE FRONT PANEL, OR POSITIONED FOR 1.5 TO 1.7 MC RANGE.
5. ALL SWITCHES AND RELAYS ARE SHOWN IN THEIR NORMAL POSITION WITH POWER REMOVED.

**THE PHYSICAL LOCATION OF COMPONENTS**

<table>
<thead>
<tr>
<th>SYMBOL GROUPS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBCHASSIS</td>
</tr>
<tr>
<td>EXCITER</td>
</tr>
<tr>
<td>POWER AMPLIFIER</td>
</tr>
<tr>
<td>DISCRIMINATOR</td>
</tr>
<tr>
<td>MODULATOR</td>
</tr>
<tr>
<td>MAIN FRAME AND FRONT PANEL</td>
</tr>
<tr>
<td>MASTER OSCILLATOR</td>
</tr>
<tr>
<td>ANTENNA NETWORK SERVO</td>
</tr>
<tr>
<td>AMPLIFIER</td>
</tr>
<tr>
<td>ANTENNA TUNING CAPACITOR</td>
</tr>
<tr>
<td>VARIABLE INDUCTOR</td>
</tr>
</tbody>
</table>

**TM806-108(2)**

390412 O - 56 (In pocket) No. 24