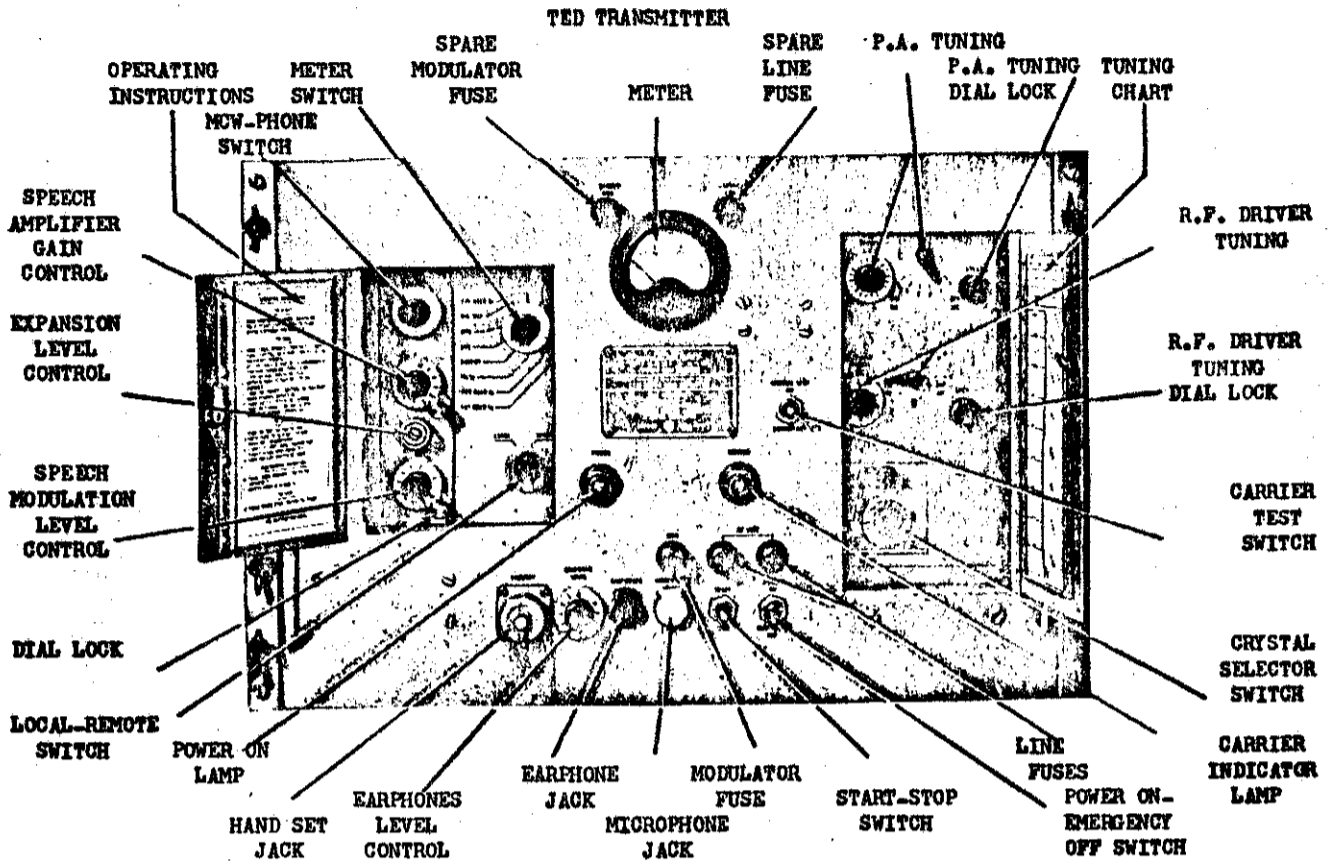


I. CHARACTERISTICS OF UHF COMMUNICATIONS.

- A. SHORT RANGE
- B. PRIMARILY USED FOR SHORT RANGE TACTICAL CIRCUITS
- C. UTILIZES DIRECT RADIO WAVE
 - 1. DIRECT RADIO WAVE - THAT PORTION OF THE RADIO FREQUENCY WAVE WHICH PASSES DIRECTLY FROM THE TRANSMITTING ANTENNA TO THE RECEIVING ANTENNA
 - 2. GENERALLY REFERRED TO AS "LINE OF SIGHT TRANSMISSION".



II. CHARACTERISTICS OF THE TED TRANSMITTER

- A. SHORT RANGE UHF TRANSMITTER
- B. FREQUENCY RANGE - 225 to 400 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. TYPES OF EMISSION
 - 1. MCW - (USED FOR CW COMMUNICATIONS)
 - 2. PHONE - (USED FOR VOICE COMMUNICATIONS)
- E. OUTPUT POWER - 12 to 15 WATTS

NOTE: THE FREQUENCY MARKED ON THE TED TRANSMITTER CRYSTAL IS THE OSCILLATOR FREQUENCY. THE TRANSMITTER OUTPUT FREQUENCY IS 12 TIMES THE OSCILLATOR FREQUENCY.

- 1. AM-1365/URT POWER AMPLIFIER BOOST POWER TO 100 WATTS WHEN USED WITH THE TED TRANSMITTER
- 2. AM-1365/URT POWER AMPLIFIER IS OPTIONAL EQUIPMENT, WHEN USED WILL INCREASE EFFECTIVE RANGE OF TED

III. TUNING AND OPERATION OF THE TED TRANSMITTER

A. TUNING

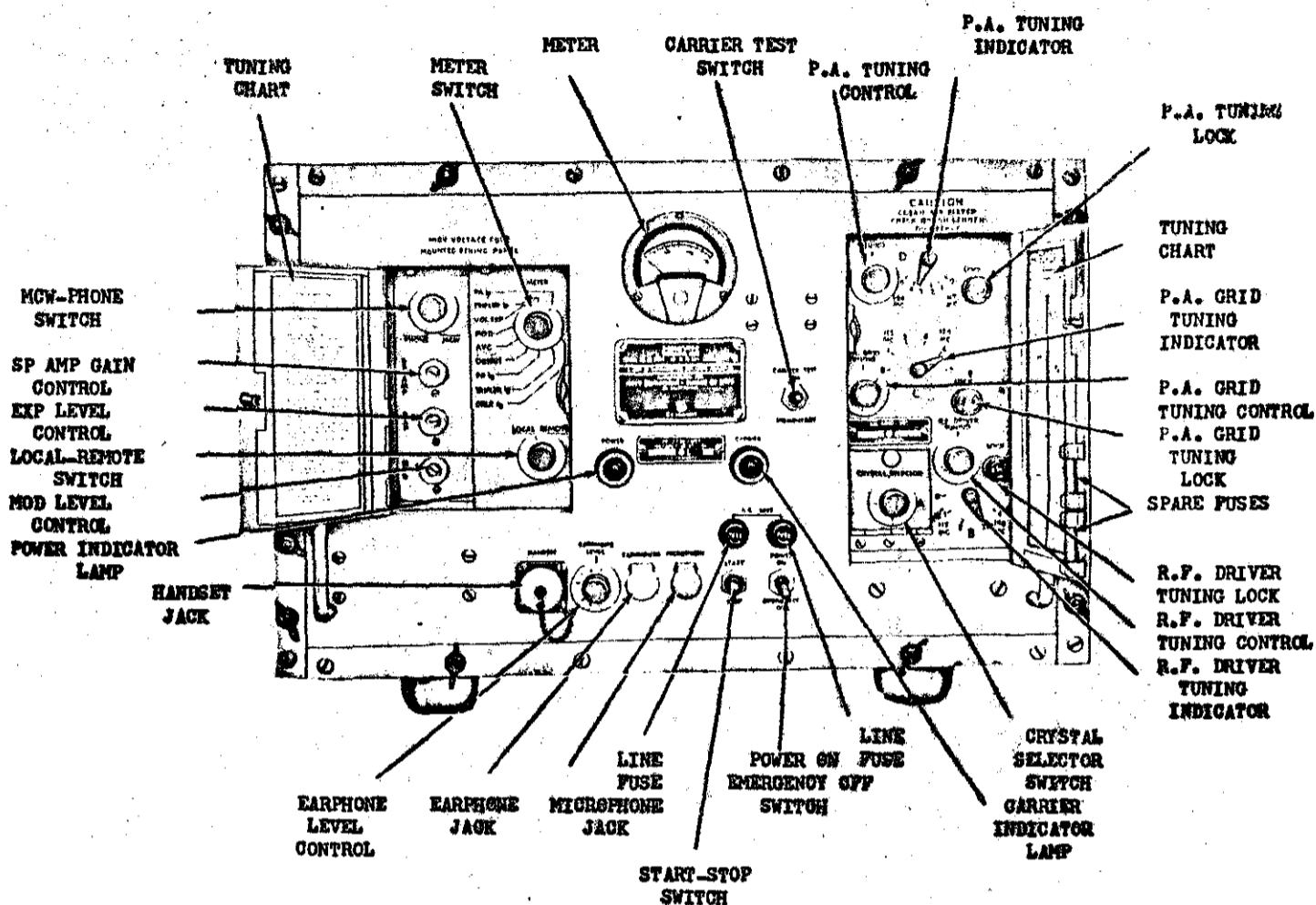
- 1. OPEN CRYSTAL HOUSING DOOR ON RIGHT HAND SIDE OF EQUIPMENT, INSERT CRYSTAL INTO ONE OF THE FOUR CRYSTAL TURRET POSITIONS. ROTATE CRYSTAL SO THAT IT APPEARS ON THE RIGHT HAND SIDE FACING APT OF EQUIPMENT. SHUT AND LOCK CRYSTAL HOUSING DOOR.
- 2. SET LOCAL-REMOTE SWITCH TO THE LOCAL POSITION
- 3. PLACE MCW-PHONE SWITCH TO THE APPROPRIATE MODE OF OPERATION.
- 4. SET THE METER SWITCH TO THE 2ND DBLR I_g POSITION
- 5. PLACE THE R.F. DRIVER TUNING CONTROL AND P.A. TUNING CONTROL TO THE SETTINGS INDICATED ON THE TUNING CHART LOCATED ON INNER RIGHT HAND DOOR.
- 6. PLACE THE POWER ON-EMERGENCY OFF SWITCH TO THE ON POSITION.
- 7. PLACE THE START-STOP SWITCH TO THE START POSITION UNTIL THE RED POWER ON LAMP LIGHTS, AND THE TRANSMITTER VENTILATION BLOWER MOTOR IS HEARD. (CAUTION: IF VENTILATION BLOWER MOTOR IS NOT HEARD, SECURE EQUIPMENT BY UTILIZING POWER ON-EMERGENCY OFF SWITCH IMMEDIATELY AND REPORT CONDITION TO THE COMMUNICATION SUPERVISOR).
- 8. PLACE THE CARRIER TEST SWITCH TO THE ON POSITION (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN).
- 9. ROTATE THE R.F. DRIVER TUNING CONTROL UNTIL A MAXIMUM METER READING IS ACHIEVED.
- 10. RELEASE CARRIER TEST SWITCH.
- 11. RETURN TO METER SWITCH AND PLACE INTO THE PA I_g POSITION
- 12. PLACE THE CARRIER TEST SWITCH TO THE ON POSITION (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN).
- 13. RETURN TO R.F. DRIVER TUNING CONTROL AND IMPROVE METER READING AS MUCH AS POSSIBLE.
- 14. RELEASE CARRIER TEST SWITCH.
- 15. LOCK R.F. DRIVER TUNING CONTROL BY UTILIZING R.F. DRIVER TUNING DIAL LOCK.
- 16. RETURN TO METER SWITCH AND PLACE INTO THE OUTPUT POSITION
- 17. PLACE THE CARRIER TEST SWITCH TO THE ON POSITION (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN).
- 18. ROTATE THE P.A. TUNING CONTROL UNTIL A MAXIMUM METER READING IS ACHIEVED.
- 19. RELEASE CARRIER TEST SWITCH.
- 20. LOCK P.A. TUNING CONTROL BY UTILIZING P.A. TUNING DIAL LOCK.
- 21. TRANSMITTER IS NOW TUNED. IF REMOTE CONTROL IS TO BE USED, SET THE LOCAL-REMOTE SWITCH TO THE REMOTE POSITION.

ANY ORDER THIS ONLY

B. OPERATION OF THE TED TRANSMITTER

1. THE TED TRANSMITTER CAN BE OPERATED LOCALLY BY JACKING A MICROPHONE OR HANDSET INTO THE APPROPRIATE JACK LOCATED ON THE FRONT OF THE CABINET.
2. THE TED TRANSMITTER CAN BE OPERATED FROM A REMOTE POSITION BY PLACING THE LOCAL-REMOTE SWITCH INTO THE REMOTE POSITION.

AN/URT-7 TRANSMITTER



I. CHARACTERISTICS OF THE AN/URT-7 TRANSMITTER

- A. SHORT RANGE VHF TRANSMITTER
- B. FREQUENCY RANGE 115 to 156 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. TYPES OF EMISSION
 1. MCW - (USED FOR CW COMMUNICATIONS)
 2. PHONE - (USED FOR VOICE COMMUNICATIONS)
- E. OUTPUT POWER - 30 WATTS

NOTE: THE FREQUENCY MARKED ON THE AN/URT-7 TRANSMITTER CRYSTAL IS THE OSCILLATOR FREQUENCY. THE TRANSMITTER OUTPUT FREQUENCY IS 6 TIMES THE OSCILLATOR FREQUENCY.

II. TUNING AND OPERATION OF THE AN/URT-7 TRANSMITTER

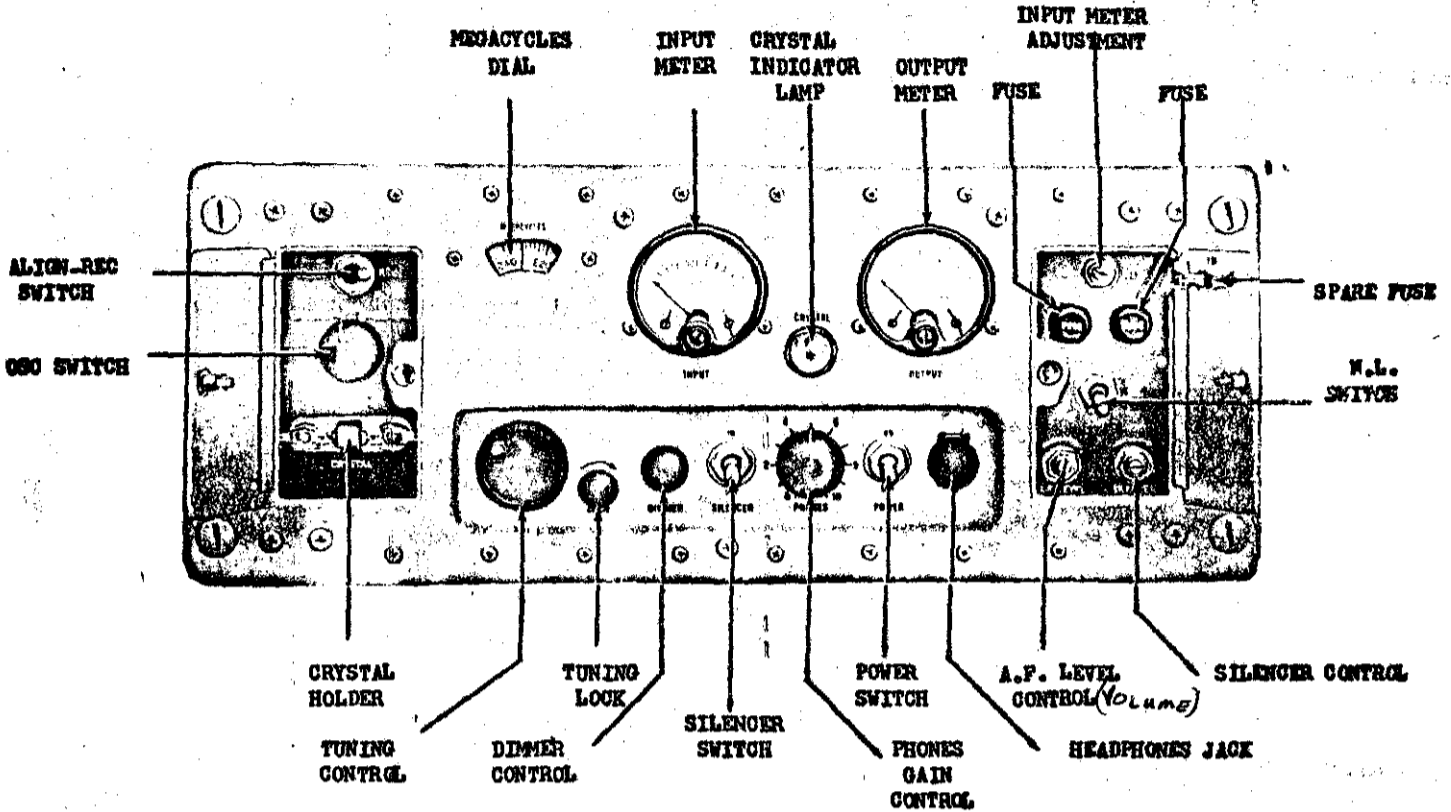
A. TUNING

1. OPEN CRYSTAL HOUSING DOOR ON RIGHT HAND SIDE OF EQUIPMENT, INSERT CRYSTAL INTO ONE OF THE FOUR CRYSTAL TURRET POSITIONS. ROTATE CRYSTAL SO THAT IT APPEARS ON THE RIGHT HAND SIDE FACING APT OF EQUIPMENT. SHUT AND LOCK CRYSTAL HOUSING DOOR.
2. SET LOCAL-REMOTE SWITCH TO THE LOCAL POSITION
3. PLACE MCW-PHONE SWITCH TO THE APPROPRIATE MODE OF OPERATION.
4. PLACE THE METER SWITCH IN THE TRIPLER I_g POSITION
5. SET THE R.F. DRIVER TUNING, P.A. GRID TUNING, AND P.A. TUNING CONTROLS TO THE SETTINGS INDICATED ON THE TUNING CHART INSIDE THE RIGHTHAND DOOR.
6. SET THE POWER ON-EMERGENCY OFF SWITCH TO THE POWER ON POSITION.
7. PRESS THE START-STOP SWITCH TO THE START POSITION UNTIL THE RED POWER PANEL LAMP INDICATOR LIGHTS, AND THE TRANSMITTER VENTILATING BLOWER IS HEARD. CAUTION: IF THE LAMP INDICATES THAT THE POWER IS ON, BUT THE BLOWER MOTOR IS NOT HEARD, SHUT OFF POWER IMMEDIATELY BY THROWING THE POWER ON-EMERGENCY OFF SWITCH TO OFF TO AVOID DAMAGE TO THE EQUIPMENT. REPORT EQUIPMENT FAILURE TO WATCH SUPERVISOR IMMEDIATELY.
8. OPERATE THE CARRIER TEST SWITCH (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN)
9. ROTATE THE R.F. DRIVER TUNING CONTROL UNTIL A MAXIMUM METER READING IS ACHIEVED.
10. RELEASE CARRIER TEST SWITCH. LOCK R.F. DRIVER TUNING CONTROL.
11. PLACE THE METER SWITCH IN THE PA I_g POSITION.
12. OPERATE THE CARRIER TEST SWITCH (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN)
13. ROTATE THE P.A. GRID TUNING CONTROL AND R.F. DRIVER TUNING CONTROL FOR A MAXIMUM METER READING.
14. RELEASE CARRIER TEST SWITCH. LOCK P.A. GRID TUNING CONTROL.
15. PLACE THE METER SWITCH IN THE OUTPUT POSITION.
16. OPERATE THE CARRIER TEST SWITCH (CARRIER INDICATOR LAMP SHOULD LIGHT GREEN)
17. ROTATE THE P.A. TUNING CONTROL FOR A MAXIMUM METER READING.
18. RELEASE CARRIER TEST SWITCH. LOCK P.A. TUNING CONTROL.
19. TRANSMITTER IS NOW TUNED. IF REMOTE CONTROL IS TO BE USED, SET THE LOCAL-REMOTE SWITCH TO THE REMOTE POSITION.

B. OPERATION OF THE AN/URT-7 TRANSMITTER

1. THE AN/URT-7 TRANSMITTER CAN BE OPERATED LOCALLY BY JACKING A MICROPHONE OR HANDSET INTO THE APPROPRIATE JACK LOCATED ON THE FRONT OF THE CABINET.
2. THE AN/URT-7 TRANSMITTER CAN BE OPERATED FROM A REMOTE POSITION BY PLACING THE LOCAL-REMOTE SWITCH INTO THE REMOTE POSITION.

AN/URR-35 RECEIVER



III. CHARACTERISTICS OF THE AN/URR-35 RECEIVER

- A. UHF RECEIVER (COMMONLY CALLED THE "RED" RECEIVER)
- B. FREQUENCY RANGE 225 to 400 MHZ.
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL CONTROLLED (VARIABLE TUNED - CAN BE TUNED WITHOUT CRYSTAL)
- D. MODES OF RECEPTION
 1. MW - (USED FOR CW COMMUNICATIONS)
 2. PHONE - (USED FOR VOICE COMMUNICATIONS)

NOTE: THE FREQUENCY MARKED ON THE AN/URR-35 RECEIVER CRYSTAL IS THE OSCILLATOR FREQUENCY. THE OUTPUT FREQUENCY IS 12 TIMES THE OSCILLATOR FREQUENCY MINUS 18.6 MHZ.

IV. TUNING AND OPERATION OF THE AN/URR-35 RECEIVER

A. CRYSTAL TUNING

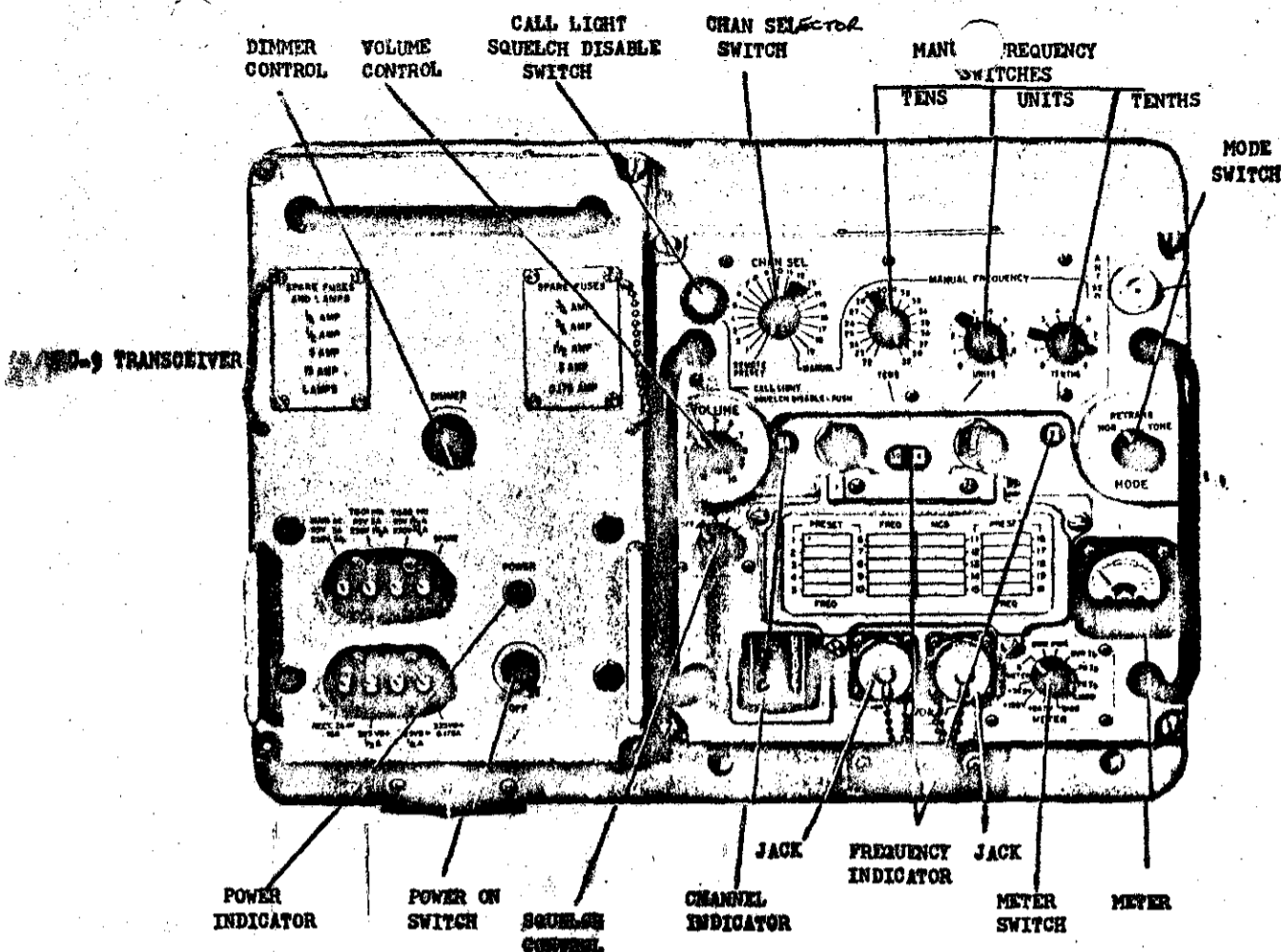
1. PLACE THE POWER SWITCH IN ITS ON POSITION.
2. INSERT CRYSTAL DESIRED INTO THE CRYSTAL HOLDER.
3. PLACE SILENCER SWITCH IN OUT POSITION.
4. PLACE N.L. SWITCH IN OUT POSITION.
5. TURN A.F. LEVEL CONTROL FULLY CLOCKWISE.
6. PLACE PHONES GAIN CONTROL IN POSITION 8.
7. OSC SWITCH TO THE CRYSTAL POSITION. (CRYSTAL INDICATOR LAMP SHOULD LIGHT)
8. ALIGN-REC SWITCH TO THE ALIGN POSITION.
9. ROTATE THE TUNING CONTROL UNTIL THE SELECTED FREQUENCY APPEARS IN THE MEGACYCLE DIAL WINDOW.
10. OBTAIN MAXIMUM READING ON INPUT METER BY UTILIZING TUNING CONTROL.
11. LOCK TUNING CONTROL WITH TUNING LOCK.
12. THROW THE ALIGN-REC SWITCH TO THE REC POSITION. RECEIVER IS NOW TUNED.

B. MANUAL TUNING (WITHOUT CRYSTAL)

1. PLACE THE POWER SWITCH IN ITS ON POSITION.
2. PLACE SILENCER SWITCH IN OUT POSITION.
3. PLACE N.L. SWITCH IN OUT POSITION.
4. TURN A.F. LEVEL CONTROL FULLY CLOCKWISE.
5. PLACE PHONES GAIN CONTROL IN POSITION 8.
6. OSC SWITCH TO THE MANUAL POSITION.
7. ALIGN-REC SWITCH TO THE REC POSITION.
8. ROTATE THE TUNING CONTROL UNTIL THE DESIRED INCOMING SIGNAL IS HEARD THROUGH THE EARPHONES.
9. LOCK TUNING CONTROL WITH TUNING LOCK. RECEIVER IS NOW TUNED.

- C. SILENCER OPERATION: IF DESIRED, THE SILENCER (SQUELCH) CIRCUIT MAY BE PUT INTO OPERATION BY PLACING THE SILENCER SWITCH AT ITS IN POSITION AND THEN ADJUSTING THE SILENCER CONTROL IN THE RIGHT HAND COMPARTMENT FOR THE DESIRED SILENCING LEVEL. IN SETTING THE SILENCER CONTROL, EXTREME CARE SHOULD BE EXERCISED AT ALL TIMES IN ORDER THAT WEAK SIGNALS WILL NOT BE LOST. THE SILENCING LEVEL SHOULD ORDINARILY BE THE POINT AT WHICH NOISE JUST BECOMES INAUDIBLE UNDER THE CONDITIONS OF NO-SIGNAL INPUT, WITH THE A.F. LEVEL CONTROL SET FOR MAXIMUM AND THE PHONES GAIN CONTROL IN POSITION 8.

- D. NOISE-LIMITER CIRCUIT: IF THE NOISE LEVEL IS EXCESSIVE WHEN A SIGNAL IS BEING RECEIVED, THE N.L. SWITCH IN THE RIGHT-HAND PANEL COMPARTMENT MAY BE THROWN TO ITS IN POSITION. THIS CIRCUIT ACTS AS A NOISE-PEAK LIMITER AND IS EFFECTIVE IN THE REDUCTION OF INTERFERENCE OF NOISE PEAKS OF HIGH INTENSITY AND SHORT DURATION. BECAUSE THE NOISE-LIMITER CIRCUIT MAY CAUSE SLIGHT DISTORTION OF DEEPLY MODULATED SIGNALS, IT SHOULD BE SWITCHED OFF WHERE RECEIVING CONDITIONS PERMIT.



I. CHARACTERISTICS OF THE AN/URC-9

- A. SHORT RANGE UHF TRANSCEIVER
- B. FREQUENCY RANGE - 225 to 399.9 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. 38 SELF CONTAINED CRYSTALS ALLOWING POSSIBILITY OF 1750 DIFFERENT FREQS
- E. TYPES OF EMISSION
 - 1. MCW
 - 2. VOICE AM
 - 3. RETRANSMIT
- F. OUTPUT POWER - 16 to 24 WATTS

II. TUNING & OPERATION OF THE AN/URC-9

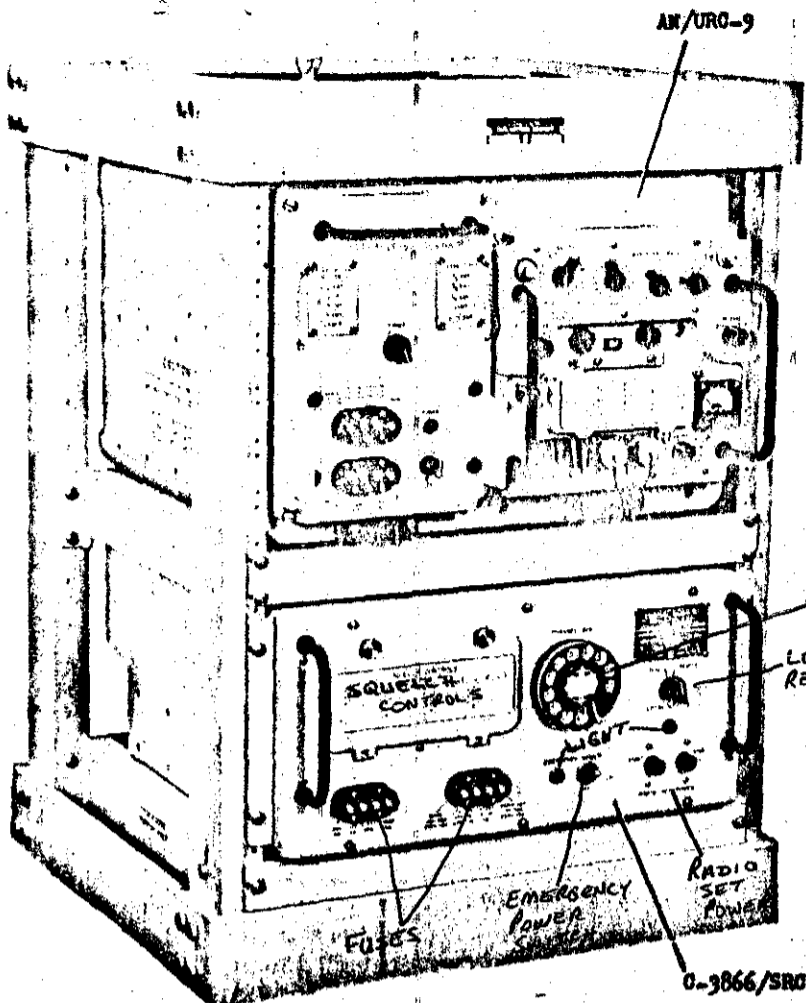
- A. MANUAL OPERATION
 - 1. CHAN SEL TO MANUAL POSITION
 - 2. TENS CONTROL TO FIRST TWO DIGITS OF FREQUENCY DESIRED
 - 3. UNITS CONTROL TO THIRD DIGIT OF FREQ
 - 4. TENTHS CONTROL TO LAST DIGIT OF FREQ
 - 5. MODE SWITCH TO APPROPRIAT POSITION
 - a. MCW - TONE POSITION
 - b. VOICE AM - NOR POSITION
 - c. RETRANSMIT - RETRANS POSITION
 - 6. VOLUME CONTROL TO MID-LEVEL POSITION
 - 7. SQUELCH OFF
 - 8. METER SWITCH TO PWR POSITION (METER SHOULD READ NORMAL WHEN BEING KEYED)
- B. AUTOMATIC TUNING (MEMORY DRUM)
 - 1. LIFT OUTER CHART TO OBTAIN ACCESS TO TUNING CHART AND MEMORY DRUM
 - 2. UTILIZING TUNING CHART, LOCATE CHANNEL DESIRED IN SET CHAN COLUMN, DIRECTLY BELOW SET CHAN NUMBER APPEARS SEL PRESET NUMBER
 - 3. ROTATE CHAN SEL CONTROL TO THE SEL PRESET NUMBER, BY SO DOING SET CHANNEL NUMBER ROTATES ON MEMORY DRUM APPEARING DIRECTLY ABOVE TUNING CHART
 - 4. SET METAL TABS ON MEMORY DRUM SO THAT THEY APPEAR OVER EACH DIGIT OF DESIRED FREQUENCY
 - 5. RETURN CHAN SEL SWITCH TO THE DESIRED CHANNEL OF OPERATION. ENSURE DESIRED CHANNEL AND FREQUENCY APPEAR IN APPROPRIAT WINDOWS
 - 6. SET MODE SWITCH TO DESIRED MODE OF OPERATION
 - 7. VOLUME CONTROL TO MID-LEVEL POSITION
 - 8. SQUELCH OFF
 - 9. METER SWITCH TO PWR POSITION (METER SHOULD READ NORMAL WHEN BEING KEYED)

III. CHARACTERISTICS OF THE AN/SRA-33

- A. UHF ANTENNA COUPLER
- B. FREQUENCY RANGE - 225 to 399.9 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. PURPOSE - ELECTRICALLY TUNES UHF ANTENNA
 - 1. ADD CAPACITANCE - ELECTRICALLY SHORTENS ANTENNA
 - 2. ADD INDUCTANCE - ELECTRICALLY LENGTHENS ANTENNA
- E. 38 SELF CONTAINED CRYSTALS ALLOWING POSSIBILITY OF 1750 DIFFERENT FREQUENCIES

IV. TUNING & OPERATION OF THE AN/SRA-33

- A. MANUAL OPERATION
 - 1. MANUAL-LOCAL PRESET-REMOTE PRESET POSITION SWITCH TO THE MANUAL POSITION
 - 2. TENS CONTROL TO FIRST TWO DIGITS OF FREQUENCY DESIRED
 - 3. UNITS CONTROL TO THIRD DIGIT OF FREQ
 - 4. TENTHS CONTROL TO LAST DIGIT OF FREQ
 - 5. DIAL IN FREQUENCY WINDOW SHOULD NOW READ FREQUENCY DESIRED
- B. AUTOMATIC TUNING (MEMORY DRUM)
 - 1. MANUAL-LOCAL PRESET-REMOTE PRESET POSITION SWITCH TO LOCAL PRESET POSITION
 - 2. LIFT OUTER CHART TO OBTAIN ACCESS TO TUNING CHART AND MEMORY DRUM
 - 3. UTILIZING TUNING CHART, LOCATE CHANNEL DESIRED IN SET CHAN COLUMN. DIRECTLY ABOVE SET CHAN NUMBER APPEARS SEL PRESET NUMBER
 - 4. ROTATE CHAN SEL CONTROL TO SEL PRESET NUMBER, BY SO DOING SET CHAN NUMBER ROTATES ON MEMORY DRUM
 - 5. SET METAL TABS ON MEMORY DRUM SO THAT THEY APPEAR OVER EACH DIGIT OF DESIRED FREQUENCY (NOTE: FIRST TAB COVERS FIRST TWO DIGITS OF DESIRED FREQUENCY)
 - 6. RETURN CHAN SELECTOR SWITCH TO THE DESIRED CHANNEL OF OPERATION. FREQUENCY DESIRED SHOULD NOW BE INDICATED IN FREQUENCY WINDOW.



I. CHARACTERISTICS OF THE AN/SRC-21 TRANSCEIVER

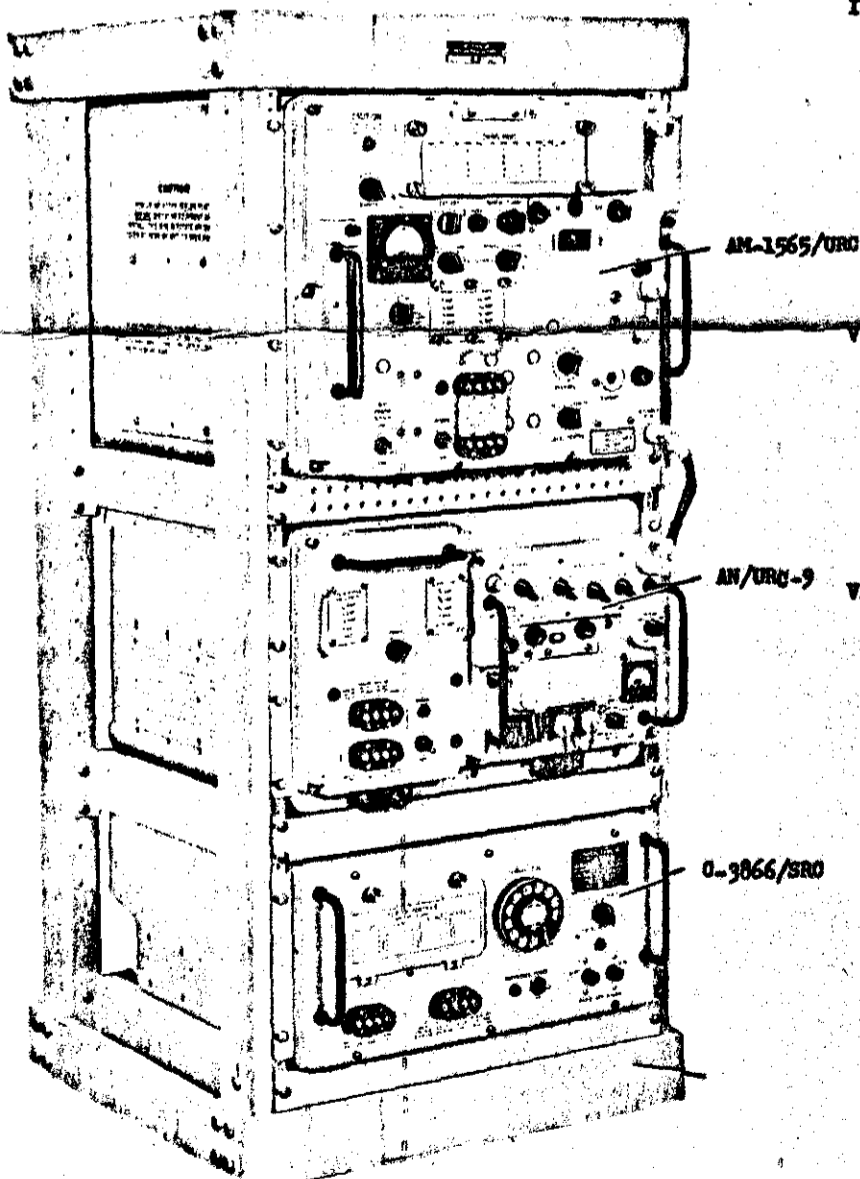
- A. SHORT RANGE UHF TRANSCEIVER
- B. FREQUENCY RANGE 225 TO 399.9 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. 38 SELF CONTAINED CRYSTALS ALLOWING POSSIBILITY OF 1750 DIFFERENT FREQUENCIES SPACED .1 MHZ APART.
- E. MODES OF EMISSION
 - 1. MCW
 - 2. VOICE AM
 - 3. RETRANSMIT
- F. OUTPUT POWER - 16 TO 24 WATTS

II. COMPOSITION

- A. AN/URC-9 TRANSCEIVER (PREVIOUSLY DESCRIBED)
- B. C-3866/SRC RADIO SET CONTROL
 - 1. CONTAINS A PUSHBUTTON START-STOP CIRCUIT WHICH CONTROLS PRIMARY POWER TO AN/SRC-21.
 - 2. A TELEPHONE TYPE DIAL IS USED TO SELECT ANY ONE OF THE 19 PRESET CHANNELS.
 - 3. NINETEEN SQUELCH LEVEL POTENTIOMETERS ARE AVAILABLE IN THE C-3866/SRC FOR SETTING THE SQUELCH LEVEL OF EACH PRESET CHANNEL.

III. TUNING AND OPERATION OF THE AN/SRC-21

- A. HAVING CHANNELIZED THE AN/URC-9 TRANSCEIVER, PLACE THE CHANNEL SELECTION SWITCH INTO THE REMOTE PRESET POSITION.
- B. HAVING CHANNELIZED THE AN/SRA-33 ANTENNA COUPLER, PLACE THE MANUAL-LOCAL PRESET-REMOTE PRESET POSITION SWITCH INTO THE REMOTE PRESET POSITION.
- C. AUTOMATIC CHANNEL SELECTION CAN NOW BE PERFORMED BY DIALING THE CHANNEL DESIRED ON THE CHANNEL SELECTOR DIAL LOCATED ON THE C-3866/SRC. ONCE HAVING DIALED THE CHANNEL DESIRED, BOTH THE AN/URC-9 TRANSCEIVER AND THE AN/SRA-33 ANTENNA COUPLER WILL ROTATE TO THE CHANNEL DIALED. WHEN DIALING CHANNELS 11 THRU 19 THE A REPLACES THE FIRST DIGIT OF THE CHANNEL. I.E. CHANNEL 19 DIAL A9



IV. CHARACTERISTICS OF THE AN/SRC-20 TRANSCEIVER

- A. SHORT RANGE UHF TRANSCEIVER
- B. FREQUENCY RANGE 225 TO 399.9 MHZ
- C. TYPE OF FREQUENCY CONTROL - CRYSTAL
- D. 38 SELF CONTAINED CRYSTALS ALLOWING POSSIBILITY OF 1750 DIFFERENT FREQUENCIES SPACED AT .1 MHZ APART.
- E. MODES OF EMISSION
 - 1. MCW
 - 2. VOICE AM
 - 3. RETRANSMIT
- F. OUTPUT POWER - 100 TO 200 WATTS

V. COMPOSITION

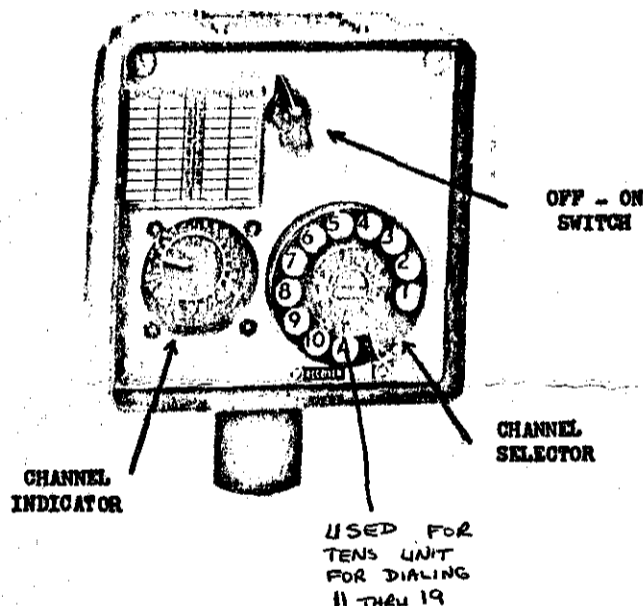
- A. AN/URC-9 TRANSCEIVER (PREVIOUSLY DESCRIBED)
- B. C-3866/SRC RADIO SET CONTROL (DESCRIBED ABOVE)
- C. AM-1565/URC R.F. AMPLIFIER
 - 1. INCREASES OUTPUT POWER OF THE AN/URC-9 TRANSCEIVER TO A MINIMUM OF 100 WATTS, A MAXIMUM OF 200 WATTS.
 - 2. INCREASE IN OUTPUT POWER IS INCREASE IN EFFECTIVE RANGE OF THE EQUIPMENT.

VI. TUNING AND OPERATION OF THE AN/SRC-20

- A. MANUAL OPERATION
 - 1. TUNING OF THE AN/URC-9 TRANSCEIVER REMAINS AS PREVIOUSLY DESCRIBED.
 - 2. AM-1565/URC R.F. AMPLIFIER TUNING:
 - a. RF POWER OUTPUT SWITCH TO HIGH
 - b. METER SWITCH TO PWR OUT
 - c. EXCITATION CONTROL TO HIGH
 - d. LOCAL-REMOTE SWITCH TO LOCAL
 - e. CHAN SEL SWITCH TO MANUAL
 - f. MANUAL-AUTO SWITCH TO MANUAL
 - g. VARY MANUAL TUNING CONTROL UNTIL FIRST TWO DIGITS OF DESIRED FREQUENCY APPEARS DIRECTLY BEHIND RED HAIRLINE APPEARING IN FREQUENCY WINDOW.
 - h. TEST KEY SWITCH TO LOCK POSITION (RED HV B INDICATOR LIGHT SHOULD LIGHT)
 - 1. VARY MANUAL TUNING CONTROL UNTIL A MAXIMUM METER READING IS OBTAINED.
 - j. RELEASE TEST KEY SWITCH.

- B. AUTOMATIC TUNING (MEMORY DRUM)**
1. TUNING OF THE AN/URC-9 REMAINS AS PREVIOUSLY STATED.
 2. AM-1565/URC R.F. AMPLIFIER TUNING:
 - a. RF POWER OUTPUT TOGGLE SWITCH TO HIGH.
 - b. METER SWITCH TO PWR OUT POSITION.
 - c. EXCITATION CONTROL TO HIGH POSITION.
 - d. LOCAL-REMOTE SWITCH TO LOCAL POSITION.
 - e. CHAN SEL SWITCH TO DESIRED CHANNEL.
 - f. MANUAL-AUTO SWITCH TO MANUAL POSITION.
 - g. LIFT OUTER CHART DOOR TO OBTAIN ACCESS TO PRESET CHANNEL POTENTIOMETERS.
 - h. VARY POTENTIOMETER CONTROLLING CHANNEL DESIRED UNTIL FIRST TWO DIGITS OF DESIRED FREQUENCY APPEARS DIRECTLY BEHIND RED HAIRLINE IN FREQ MC WINDOW.
 - i. TEST KEY SWITCH TO LOCK POSITION (RED HV B INDICATOR LIGHT SHOULD LIGHT)
 - j. VARY POTENTIOMETER CONTROLLING CHANNEL DESIRED UNTIL A MAXIMUM METER READING IS OBTAINED.
 - k. RELEASE TEST KEY SWITCH.
- G. C-3866/SRC RADIO SET CONTROL OPERATION**
1. AUTOMATIC CHANNEL SELECTION CAN BE ACHIEVED BY DIALING THE CHANNEL DESIRED ON THE CHANNEL SELECTOR DIAL LOCATED ON THE C-3866/SRC. TO ACHIEVE THIS CAPABILITY THE BELOW LISTED STEPS MUST FIRST BE PERFORMED:
 - a. AN/URC-9 TRANSCEIVER CHANNEL SELECTOR SWITCH MUST BE IN THE REMOTE PRESET POSITION.
 - b. AM-1565/URC R.F. AMPLIFIER MUST HAVE MANUAL-AUTO SWITCH IN AUTO POSITION AND LOCAL-REMOTE SWITCH IN REMOTE POSITION.
 - c. AN/SRA-33 ANTENNA COUPLER MANUAL-LOCAL PRESET-REMOTE PRESET POSITION SWITCH TO THE REMOTE PRESET POSITION.
 2. HAVING PERFORMED THE ABOVE STEPS, DIAL THE CHANNEL DESIRED ON THE C-3866/SRC RADIO SET CONTROL. THE AN/URC-9 TRANSCEIVER, AN/SRA-33 ANTENNA COUPLER AND AM-1565/URC R.F. AMPLIFIER WILL CHANGE TO THE CHANNEL DIALED.

**C-3868/SRC
INDICATOR CONTROL**

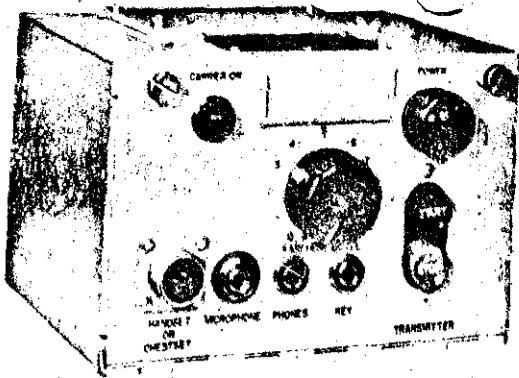


VII. CHARACTERISTICS OF THE C-3868/SRC INDICATOR CONTROL

- A. THE C-3868/SRC IS AN INDICATOR CONTROL WHICH ENABLES REMOTE CHANNEL CONTROL OF THE AN/SRC-21 OR AN/SRC-20 TRANSCEIVER.
- B. INSTALLATION OF C-3868/SRC'S IS OPTIONAL AND NOT CONSIDERED A PART OF THE AN/SRC-21 OR AN/SRC-20.
- C. MAXIMUM OF FOUR (4) C-3868/SRC'S FOR EACH AN/SRC-21 OR AN/SRC-20.
- D. USUALLY LOCATED IN SPACES EXTERNAL OF RADIO. I.E. RADAR, BRIDGE, ETC.

VIII. TUNING AND OPERATION OF THE C-3868/SRC

- A. WHEN CONTROLLING THE AN/SRC-21 THE BELOW LISTED STEPS MUST FIRST BE PERFORMED:
 1. AN/URC-9 TRANSCEIVER CHANNEL SELECTOR SWITCH TO THE REMOTE PRESET POSITION.
 2. C-3866/SRC RADIO SET CONTROL LOCAL-REMOTE SWITCH TO THE REMOTE PRESET POSITION.
 3. AN/SRA-33 ANTENNA COUPLER MANUAL-LOCAL PRESET-REMOTE PRESET POSITION SWITCH TO THE REMOTE PRESET POSITION.
- B. WHEN CONTROLLING THE AN/SRC-20 THE BELOW LISTED STEPS MUST FIRST BE PERFORMED:
 1. AN/URC-9 TRANSCEIVER, C-3866/SRC RADIO SET CONTROL, AND AN/SRA-33 ANTENNA COUPLER REMAINS AS STATED ABOVE.
 2. AM-1565/URC R.F. AMPLIFIER MANUAL-AUTO SWITCH IN AUTO POSITION, LOCAL-REMOTE TO THE REMOTE POSITION.
- C. HAVING PERFORMED THE APPROPRIATE STEPS LISTED ABOVE, REMOTE CHANNEL CONTROL CAN BE ACHIEVED BY UTILIZING THE C-3868/SRC. DIAL CHANNEL DESIRED ON CHANNEL SELECTOR (TELEPHONE TYPE DIAL). NOTE: THERE IS A THREE SECOND TIME DELAY OCCURRING WHEN DIALING A CHANNEL ON THE C-3868/SRC. ONCE EQUIPMENT HAS CHANGED CHANNELS IN RADIO, THE CHANNEL INDICATOR WILL INDICATE NEW CHANNEL.



- IX. CHARACTERISTICS OF THE C-1138/UR RADIO SET CONTROL**
- A. DESCRIPTION** - RADIO SET CONTROL WHICH ENABLES THE CONTROL OF BOTH A TRANSMITTER AND RECEIVER FROM A REMOTE POSITION. COMMONLY REFERRED TO AS A RFU (RADIOPHONE UNIT)
- B. PURPOSE** - THE RADIO SET CONTROL, MODEL C-1138/UR IS THE MEDIUM FOR REMOTE OPERATION OF A STANDARD SHIPBOARD RADIO TRANSMITTER AND RECEIVER. IT PROVIDES THE MEANS TO:
1. TURN THE TRANSMITTER ON AND OFF.
 2. VOICE MODULATE OR KEY THE OUTPUT OF THE CONTROLLED TRANSMITTER.
 3. REGULATE THE LEVEL OF THE AUDIO OUTPUT OF THE RECEIVER TO THE EARPHONES.

X. OPERATION OF THE C-1138/UR RADIO SET CONTROL

A. TRANSMITTER OFF-ON SWITCH

1. TO ENERGIZE THE CONTROLLED TRANSMITTER PRESS THE START BUTTON MOMENTARILY. THIS ENERGIZES THE STARTING RELAY IN THE TRANSMITTER AND THE POWER INDICATOR IS ILLUMINATED.
2. TO DE-ENERGIZE THE TRANSMITTER PRESS THE STOP BUTTON. THIS SHORTS THE STARTING RELAY COIL IN THE TRANSMITTER, DE-ENERGIZING THE STARTING RELAY AND THE POWER INDICATOR.

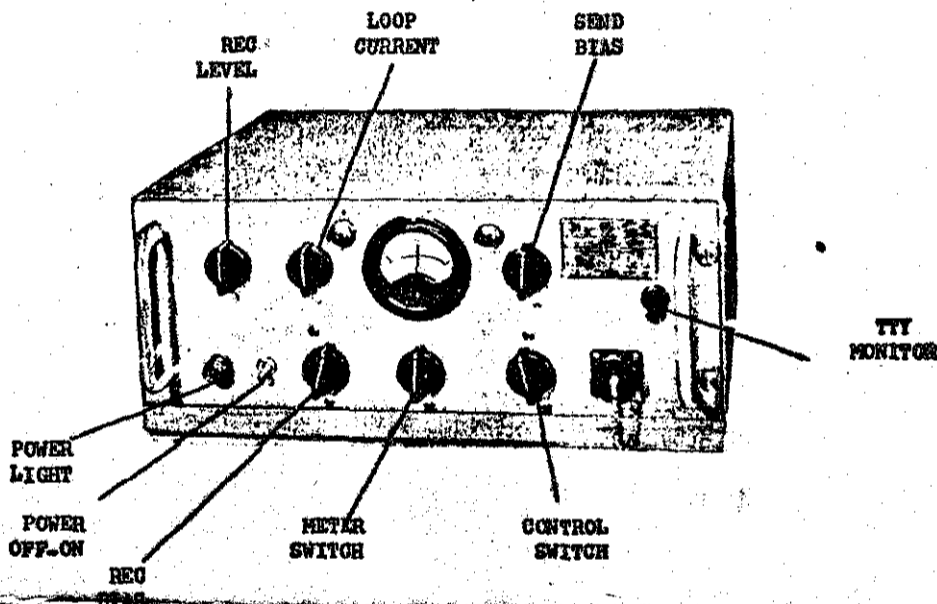
B. TRANSMITTER INPUT CIRCUITS

1. DEPENDING UPON WHAT TYPE OF EMISSION IS BEING UTILIZED, THE OPERATOR MAY USE A KEY, HANDSET, CHESTSET OR MICROPHONE. WHEN VOICE MODULATION IS USED THE OPERATOR MUST ACTUATE THE PUSH-TO-TALK SWITCH ON THE MICROPHONE, HANDSET OR CHESTSET HE IS USING. THIS ENERGIZES THE CARRIER ON INDICATOR ON THE C-1138/UR INDICATING THAT THE TRANSMITTER IS IN USE.

C. EARPHONE LEVEL CONTROL

1. CONTROLS THE VOLUME OF THE RECEIVER BEING UTILIZED.
2. THE EARPHONE LEVEL POTENTIOMETER IS ADJUSTED BY EACH OPERATOR TO SUIT HIS OWN LISTENING HABITS.

AN/SGC-1A



XI. CHARACTERISTICS OF THE AN/SGC-1A TONE SHIFT KEYS/CONVERTER

- A. DESCRIPTION** - THE AN/SGC-1A IS A TELETYPEWRITER TERMINAL EQUIPMENT WHICH ENABLES THE TRANSMISSION AND RECEPTION OF TELETYPEWRITER MESSAGES BY RADIO COMMUNICATIONS BETWEEN STATIONS SIMILARLY EQUIPPED. THE TERMINAL CONVERTS THE INTELLIGENCE OF OUTGOING MESSAGES TO AUDIO TONE SIGNALS THAT CAN BE TRANSMITTED BY A VOICE-OPERATED RADIO TRANSMITTER. ALSO, IT RECONVERTS THE INTELLIGENCE OF INCOMING SIGNALS TO A FORM THAT CAN CAUSE A TELETYPEWRITER TO PRINT THE MESSAGE.
- B. PURPOSE** - THE AN/SGC-1A IS PRIMARILY USED FOR SHORT RANGE TELETYPE COMMUNICATIONS USING UHF AND VHF FREQUENCY BANDS, BUT IT CAN BE USED WITH ANY TRANSMITTER DESIGNED FOR VOICE MODULATION.

XII. TUNING AND OPERATION OF THE AN/SGC-1A TONE SHIFT KEYS/CONVERTER

A. TUNING THE AN/SGC-1A

1. TURN POWER SWITCH TO ON.
2. TURN CONTROL SWITCH TO TRS POSITION.
3. TURN METER SWITCH TO LOOP CURR. ADJUST THE CONTROL MARKED LOOP CURR UNTIL THE METER READS 6% ON THE UPPER SCALE. IF THE METER READS ZERO, THE SOURCE OF LOOP CURRENT MAY NOT BE ENERGIZED.
4. TURN THE CONTROL SWITCH TO AUTO. HOLD DOWN THE SPACE BAR ON THE TELETYPEWRITER AND TURN THE METER SWITCH TO THE SEND BIAS POSITION. THE METER SHOULD READ ZERO ON THE UPPER SCALE. IF NOT, CORRECT BY MEANS OF THE SEND BIAS CONTROL. THEN TURN THE METER SWITCH BACK TO OFF BEFORE RELEASING THE SPACE BAR.
5. WHEN A TELETYPE SIGNAL IS RECEIVED FROM A DISTANT STATION, TURN THE METER SWITCH TO REC LEVEL AND ADJUST THE REC LEVEL CONTROL UNTIL THE METER READS 0 DEM (LOWER SCALE)
6. THE LAST ADJUSTMENT IS THE REC BIAS CONTROL ADJUSTMENT FOR WHICH AN INCOMING TELETYPEWRITER SIGNAL IS REQUIRED FROM A DISTANT STATION. REQUEST A DISTANT OPERATOR TO HOLD DOWN HIS TELETYPEWRITER SPACE BAR FOR A MINUTE. WHILE HE IS HOLDING DOWN THE SPACE BAR, TURN THE METER SWITCH TO REC BIAS AND ADJUST THE REC BIAS CONTROL UNTIL THE METER READS ZERO ON THE UPPER SCALE. RETURN THE METER SWITCH TO THE OFF POSITION.
7. THE EQUIPMENT IS NOW ADJUSTED FOR OPERATION WITH ITS ASSOCIATED TELETYPEWRITER, RECEIVER, AND TRANSMITTER FOR COMMUNICATION WITH OTHER STATIONS SIMILARLY EQUIPPED.

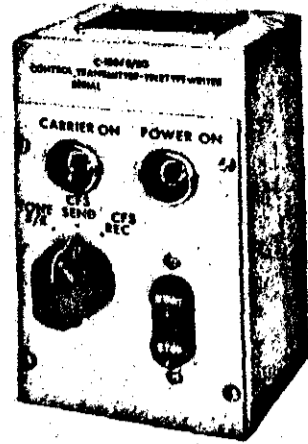
XIII. DESCRIPTION AND OPERATION OF THE C-1004B/SG CONTROL UNIT

A. GENERAL DESCRIPTION OF CIRCUITS

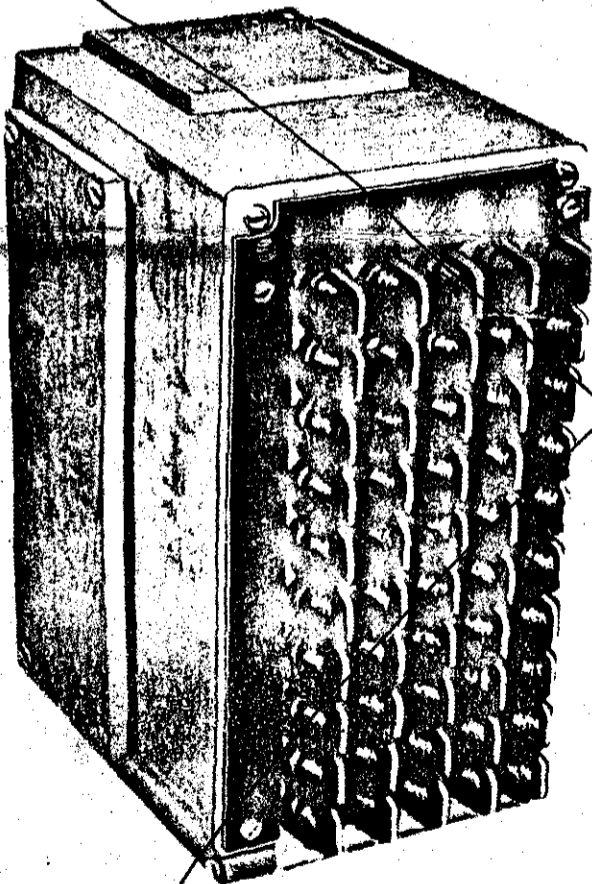
1. TRANSMITTER-TELETYPEWRITER CONTROL C-1004B/SG CONTAINS THE COMPONENTS AND CIRCUITRY NECESSARY FOR CONTROLLING A TELETYPE RADIO CIRCUIT FROM A REMOTE POSITION.
2. THE C-1004B/SG CONTROL UNIT PROVIDES THE TRANSMITTER POWER ON-OFF SWITCH, THE POWER-ON INDICATOR LAMP, CARRIER-ON INDICATOR LAMP, AND A THREE POSITION ROTARY SELECTOR SWITCH.
3. THE ROTARY SELECTOR SWITCH PROVIDES THE FUNCTIONS DESCRIBED BELOW:
 - a. SWITCHES A SEND-RECEIVE TELETYPEWRITER TO EITHER A FREQUENCY SHIFT KEYER CIRCUIT (CFS SEND), A FREQUENCY SHIFT CONVERTER OR COMPARATOR CIRCUIT (CFS REC), OR A TONE TERMINAL ON A SEND-RECEIVE BASIS (TONE S/R).
 - b. SHORTING OF THE OTHER TWO UNUSED SET OF TERMINALS WHEN THE SEND-RECEIVE TELETYPEWRITER IS CONNECTED TO THE SET OF TERMINALS ASSOCIATED WITH A PARTICULAR SWITCH POSITION.

B. OPERATION OF THE C-1004B/SG CONTROL UNIT

1. DEPRESS START BUTTON ON C-1004B/SG. THIS WILL ENERGIZE TRANSMITTER BEING UTILIZED. POWER-ON INDICATOR LIGHT SHOULD ILLUMINATE INDICATING POWER TO EQUIPMENT.
2. PLACE ROTARY SELECTOR SWITCH TO DESIRED POSITION:
 - a. WHEN THE ROTARY SWITCH IS IN THE TONE S/R POSITION, THE CARRIER ON INDICATOR LAMP AND THE TRANSMITTER CARRIER ARE OFF, THE TELETYPE IS CONNECTED TO THE TONE TERMINAL LOOP.
 - b. WHEN THE ROTARY SWITCH IS IN THE CFS SEND POSITION, THE TRANSMITTER CARRIER IS TURNED ON, THE CARRIER ON INDICATOR LIGHT IS ILLUMINATED SHOWING THAT THE CARRIER IS ON, THE TELETYPE IS CONNECTED TO THE FREQUENCY SHIFT KEYER TERMINAL.
 - c. WHEN THE ROTARY SWITCH IS IN THE CFS REC POSITION, THE CARRIER-ON INDICATOR LIGHT AND THE TRANSMITTER CARRIER ARE OFF, THE TELETYPE IS CONNECTED TO THE FREQUENCY SHIFT CONVERTER CIRCUIT.
3. THE TELETYPEWRITER CAN NOW BE OPERATED IN THE MODE OF OPERATION INDICATED BY POSITION OF ROTARY SELECTOR SWITCH.
4. ONCE HAVING CONCLUDED EQUIPMENT OPERATION, DEPRESS STOP BUTTON ON C-1004B/SG TO SECURE POWER TO EQUIPMENT.



SWITCHBOARDS AND PATCH PANELS



I. SB-82/SRR RECEIVER TRANSFER SWITCHBOARD

A. PURPOSE - TRANSFERS THE AUDIO OUTPUT FROM FIVE RADIO RECEIVERS TO A MAXIMUM OF TEN REMOTE STATIONS.

B. DESCRIPTION - SB-82/SRR RECEIVER TRANSFER SWITCHBOARD HAS FIVE VERTICAL ROWS OF TEN DOUBLE POLE, SINGLE-THROW (ON-OFF) SWITCHES THAT ARE CONTINUOUSLY ROTATABLE IN EITHER DIRECTION.

C. OPERATION

1. THE AUDIO OUTPUT FROM FIVE RADIO RECEIVERS, CONNECTED TO THE FIVE VERTICAL ROWS OF SWITCHES, MAY BE FED TO ANY OR ALL OF THE REMOTE STATIONS BY CLOSING THE PROPER SWITCH OR SWITCHES.

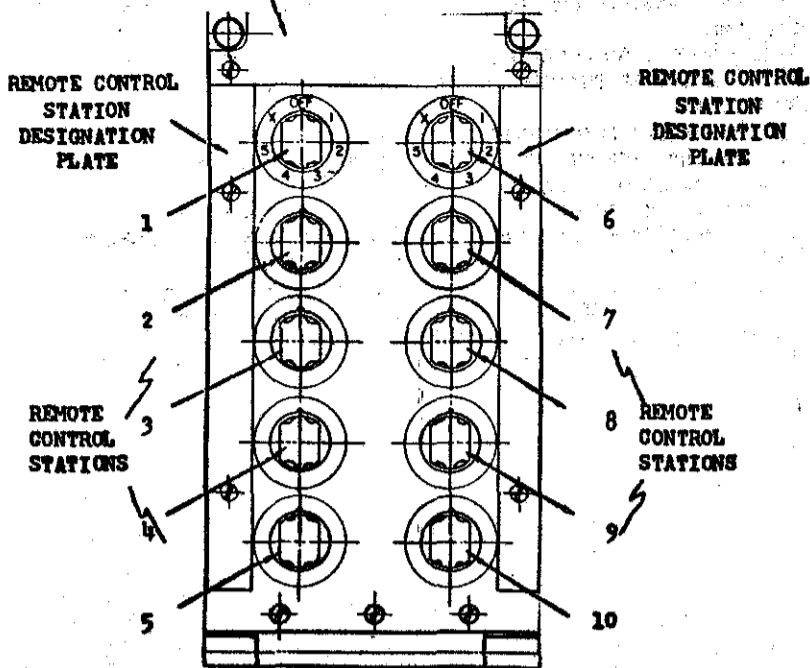
2. THE KNOB OF EACH SWITCH IS MARKED WITH A HEAVY WHITE LINE TO PROVIDE VISUAL INDICATION OF THE COMMUNICATION SETUP.

3. SWITCHBOARDS ARE ALWAYS INSTALLED WITH THE KNOBS IN THE OFF POSITION WHEN THE WHITE LINE IS VERTICAL.

4. RECEIVERS ARE ALWAYS CONNECTED TO THE VERTICAL ROWS OF SWITCHES, AND REMOTE STATIONS ARE ALWAYS CONNECTED TO THE HORIZONTAL ROWS.

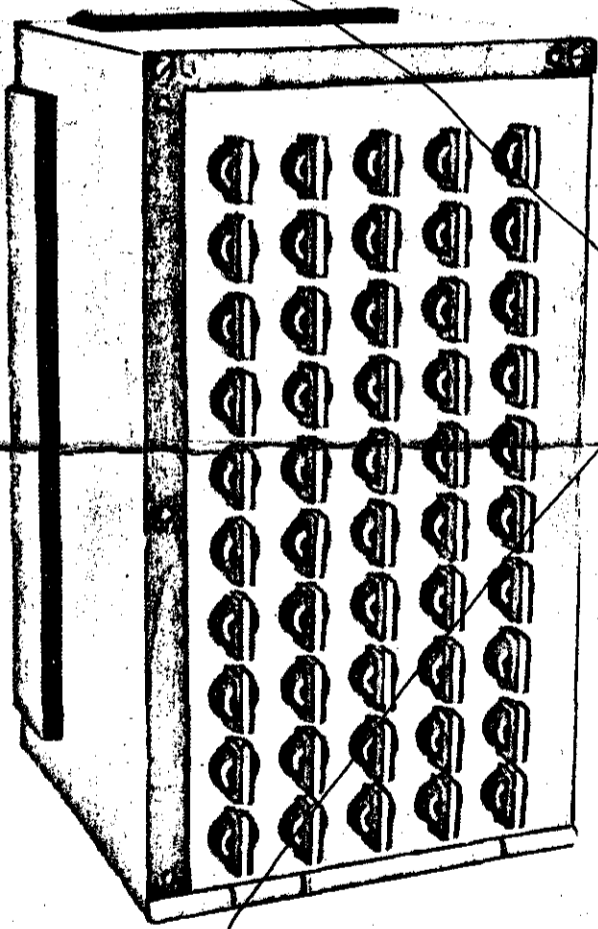
5. IDENTIFICATION OF THE RECEIVERS AND REMOTE STATIONS IS ENGRAVED ON THE LAMINATED PARALLEL LABEL STRIPS FASTENED ALONG THE TOP AND LEFT SIDES OF THE PANEL FRONT.

RECEIVER DESIGNATION PLATE



II. SB-973/SRR RECEIVER TRANSFER SWITCHBOARD

- A. PURPOSE - TRANSFERS THE AUDIO OUTPUT FROM FIVE RADIO RECEIVERS TO A MAXIMUM OF TEN REMOTE STATIONS.
- B. DESCRIPTION - SB-973/SRR SWITCHBOARD CONTAINS TEN, TWO CIRCUIT, SEVEN POSITION ROTARY SWITCHES CONNECTED TO A TERMINAL BOARD.
- C. OPERATION
 1. EACH SWITCH IN RECEIVER TRANSFER SWITCHBOARD SB-973/SRR RELATES TO A REMOTE CONTROL STATION.
 2. SWITCH POSITIONS, ONE THROUGH FIVE EACH RELATE TO A RECEIVER.
 3. POSITION X ON EACH SWITCH IS USED WHEN ADDITIONAL RECEIVERS ARE CONNECTED TO AN ADJACENT RECEIVER TRANSFER SWITCHBOARD. POSITION X SERVES TO TRANSFER THE REMOTE CONTROL STATIONS CONNECTED TO THE ORIGINAL SWITCHBOARD TO THE CORRESPONDING SWITCHES IN THE ADDITIONAL SWITCHBOARD, PERMITTING TRANSFER TO FIVE ADDITIONAL RECEIVERS.

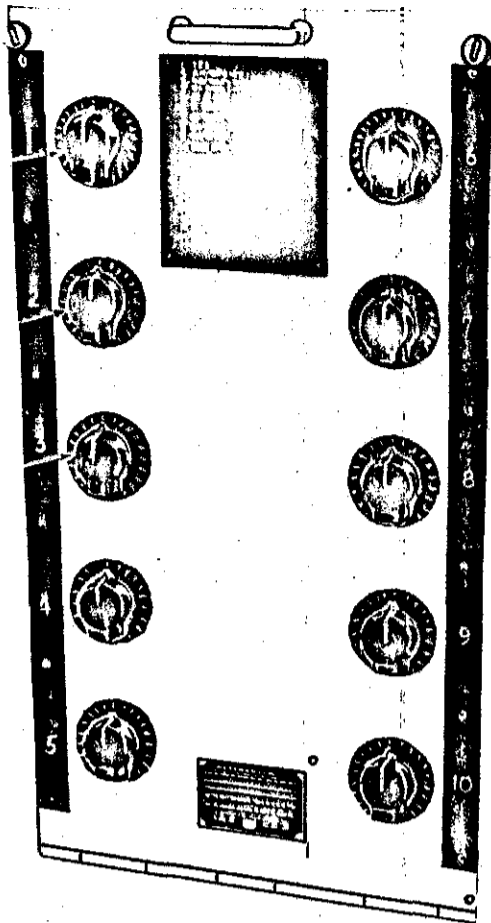


III. SB-83/SRT TRANSMITTER TRANSFER SWITCHBOARD

- A. PURPOSE - ENABLES CONTROL OF A TRANSMITTER FROM A REMOTE STATION.
- B. DESCRIPTION - SB-83/SRT SWITCHBOARD CONTAINS FIVE VERTICAL ROWS OF TEN 12 POLE, SINGLE-THROW (ON-OFF) SWITCHES. THEY ARE CONTINUOUSLY ROTATABLE IN EITHER DIRECTION.
- C. OPERATION
 1. RADIO TRANSMITTERS ARE WIRED TO THE FIVE VERTICAL ROWS.
 2. REMOTE STATIONS ARE CONNECTED TO THE TEN HORIZONTAL ROWS.
 3. SWITCHES ARE IN THE OFF POSITION WHEN THE WHITE LINES ON THE KNOBS ARE VERTICAL.
 4. A MECHANICAL INTERLOCK ARRANGEMENT PREVENTS ADDITIONAL SWITCHES IN EACH HORIZONTAL ROW FROM BEING CLOSED WHEN ANY ONE OF THE FIVE SWITCHES IN THAT ROW ALREADY HAS BEEN CLOSED. THIS ARRANGEMENT PREVENTS SERIOUS DAMAGE THAT IS CERTAIN TO RESULT FROM TWO OR MORE TRANSMITTERS FEEDING A SINGLE REMOTE STATION SIMULTANEOUSLY.
 5. ALTHOUGH THE MECHANICAL INTERLOCK WILL PREVENT CLOSING A SECOND SWITCH IN A HORIZONTAL ROW AFTER ONE SWITCH HAS BEEN CLOSED, IT WILL NOT PREVENT TWO SWITCHES FROM BEING TURNED AT THE SAME TIME. ONE FOOLPROOF WAY TO PREVENT TURNING MORE THAN ONE SWITCH AT A TIME IS TO DO ALL TRANSMITTER SWITCHING WITH ONLY ONE HAND.

IV. SB-863/SRT TRANSMITTER TRANSFER SWITCHBOARD

- A. PURPOSE - ENABLES CONTROL OF A TRANSMITTER FROM A REMOTE STATION.
- B. DESCRIPTION - SB-863/SRT SWITCHBOARD CONTAINS TEN 20-POSITION ROTARY SELECTOR SWITCHES IN TWO VERTICAL COLUMNS.
- C. OPERATION
1. EACH ROTARY SWITCH CORRESPONDS TO A REMOTE CONTROL STATION AND EACH SWITCH POSITION (1 THROUGH 19) CORRESPONDS TO A CONTROLLED TRANSMITTER.
 2. POSITION 20 OF EACH ROTARY SWITCH IS PROVIDED FOR CONNECTIONS TO AN ADDITIONAL TRANSFER SWITCHBOARD TO CONTROL EXTRA TRANSMITTERS.
 3. WHEN THE SWITCHBOARD IS INSTALLED, THE REMOTE STATIONS ASSIGNED TO EACH ROTARY SWITCH, AND THE TRANSMITTERS ASSIGNED TO POSITIONS 1 THROUGH 19, ARE ENGRAVED ON ENGRAVING PLATES



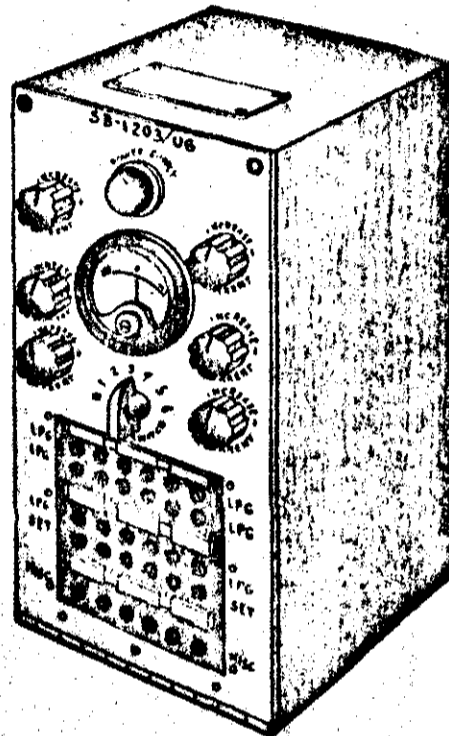
V. SB-1203/UG AND SB-1210/UGQ TELETYPE PATCH PANELS

A. PURPOSE - TELETYPE PANELS SB-1203/UG AND SB-1210/UGQ ARE USED FOR INTERCONNECTION AND TRANSFER OF SHIPBOARD TELETYPEWRITER EQUIPMENT WITH VARIOUS RADIO ADAPTERS, SUCH AS TONE SHIFT KEYERS AND CONVERTERS (AN/SCG-1A PREVIOUSLY DESCRIBED).

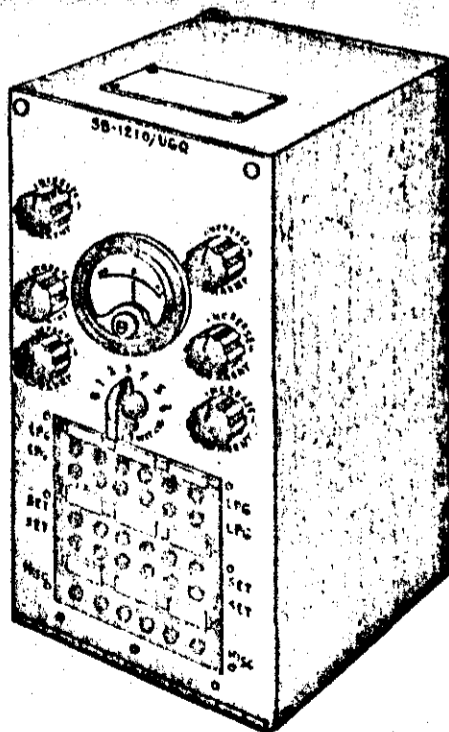
B. DESCRIPTION - THE SB-1210/UGQ IS INTENDED FOR USE WITH CRYPTOGRAPHIC DEVICES, WHEREAS THE SB-1203/UG IS A GENERAL PURPOSE PANEL. EACH PANEL CONTAINS SIX CHANNELS, WITH EACH CHANNEL COMPRISING A LOOPING SERIES CIRCUIT OF LOOPING JACKS, SET JACKS, AND A RHEOSTAT FOR ADJUSTING LINE CURRENT. THE NUMBER OF LOOPING JACKS AND SET JACKS IN EACH CHANNEL VARIES WITH THE PANEL MODEL. EACH PANEL INCLUDES A METER AND ROTARY SELECTOR SWITCH FOR MEASURING LINE CURRENT IN ANY CHANNEL. ANY TELETYPE EQUIPMENT NOT REGULARLY ASSIGNED TO A CHANNEL MAY BE CONNECTED TO SIX MISCELLANEOUS JACKS.

C. OPERATION

1. TURN ALL LINE CURRENT RHEOSTATS COUNTERCLOCKWISE TO INCREASE CIRCUIT RESISTANCE TO MAXIMUM VALUE (NOTE: THIS IS NOT NECESSARY IF SOURCE OF LINE CURRENT IS ENERGIZED)
2. TURN ON THE LOCAL LINE CURRENT SUPPLY AT THE RECEIVER UNIT AND AT THE DISTRIBUTION PANEL (NOTE: ONBOARD MOST UNITS SOURCE OF LINE CURRENT IS CONSTANT THUS ELIMINATING STEPS 1 AND 2 ABOVE). THE GREEN INDICATOR LIGHT ON THE MODEL SB-1203 PANEL WILL COME ON.
3. IF THE DESIRED TELETYPE EQUIPMENT IS WIRED IN THE SAME LOOPING CHANNEL AS THE RADIO ADAPTER (KEYER OR CONVERTER) TO BE USED, NO PATCH CORDS ARE REQUIRED.
4. TURN THE METER SELECTOR SWITCH TO THE DESIRED CHANNEL AND ADJUST THE CORRESPONDING RHEOSTAT TO GIVE A LINE CURRENT INDICATION OF 60ma.
5. IN ANY SWITCHING OPERATION BETWEEN THE VARIOUS PLUGS AND JACKS OF A TELETYPE PANEL, NEVER PULL THE PATCH PLUG FROM THE MACHINE (SET) JACK WITHOUT FIRST REMOVING THE OTHER END OF THE CORD PLUG FROM THE LOOP JACK. THE PROPER PROCEDURE IS TO TAKE THE PLUG OUT OF THE LOOPING JACK FIRST, AND TO INSERT IT LAST.
6. IN ORDER TO TAKE A MACHINE OUT OF A LOOP, TAKE A DUMMY PLUG OR A PATCH CORD AND INSERT IT INTO THE SET JACK OF THAT MACHINE. THIS ACTION WILL REMOVE ALL LOOP CURRENT FROM THAT MACHINE AND NOT DISTURB THE OTHER MACHINES IN THE LINE.



SB-1203/UG



SB-1210/UGQ