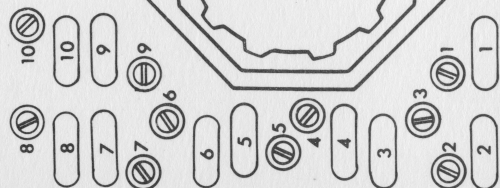


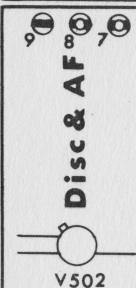
# Channel Selector



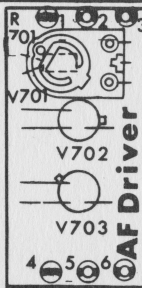
## Receiver front end



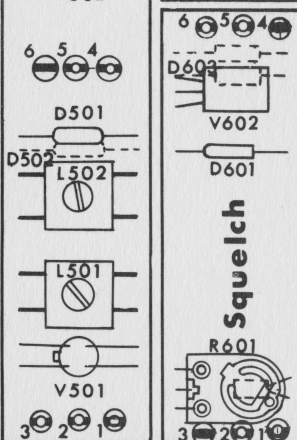
## Disc & AF



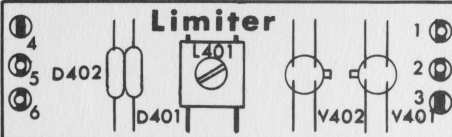
## QAF Driver



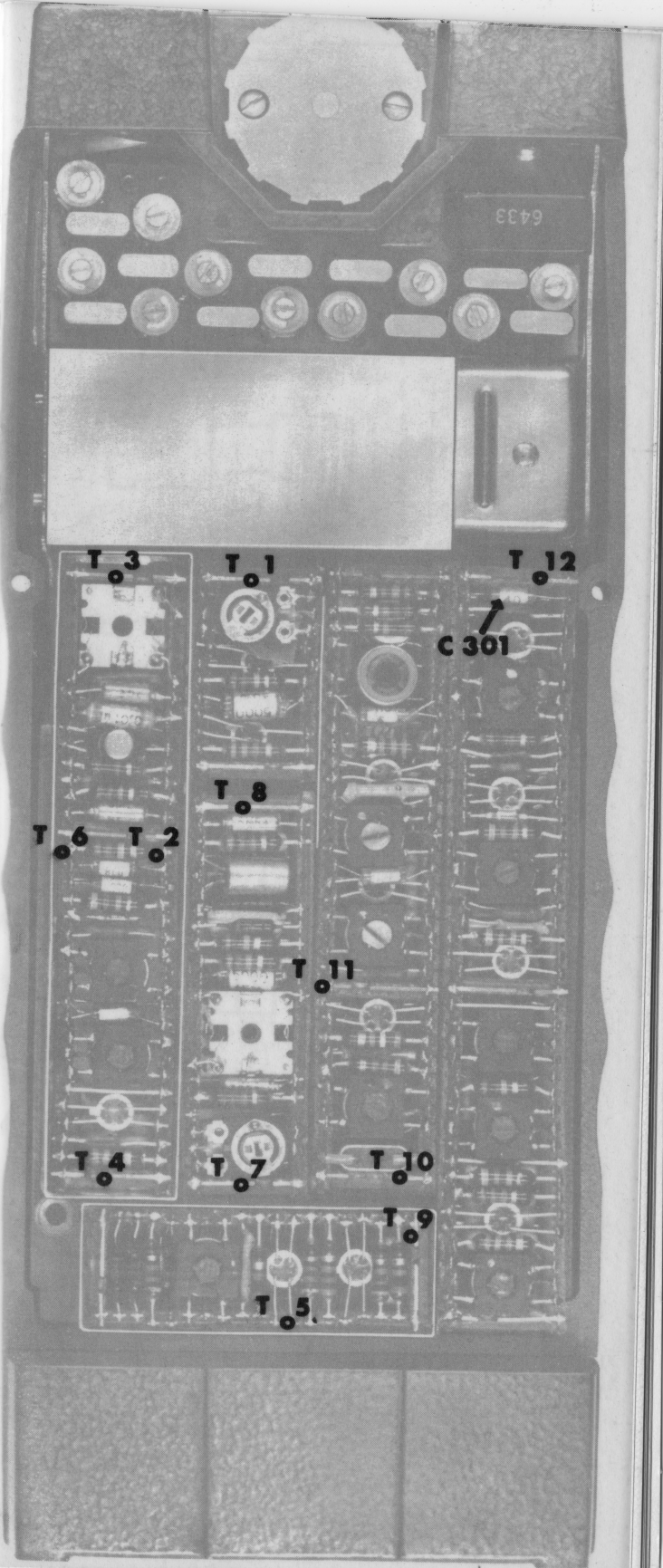
## Squelch



## Limiter

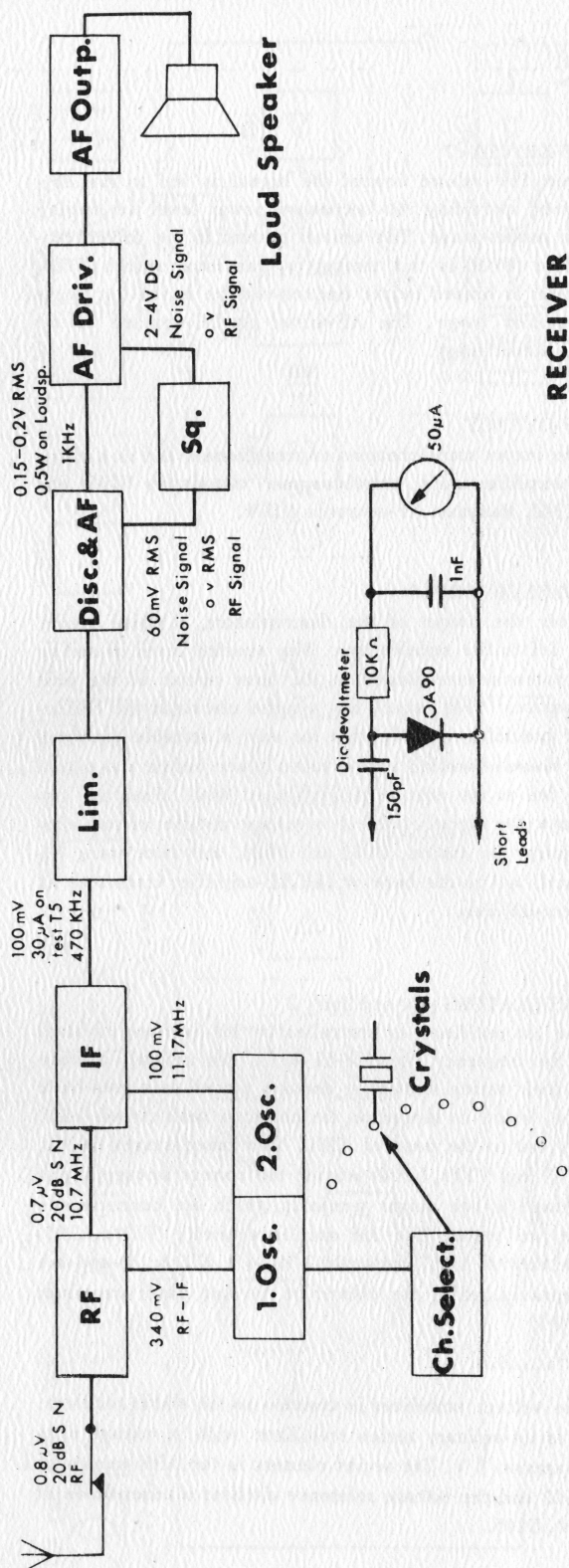


Battery









## RECEIVER TEST PROCEDURE

### AF-Driver and Output Stage 7

Due to the DC-coupling between these stages the test must take place as if it were one single unit. Apply an AF-signal of  $1000 \text{ c/s}$ ,  $150-220 \text{ mV RMS}$ . P.D. ( $R_g=100\Omega$ ) between T1 and grd., with the volume control in position 5, this signal shall cause a measured output of  $0.5 \text{ W}$  ( $3.14 \text{ V RMS}$ ) across the loudspeaker. The frequency response must be within  $\pm 1 \text{ dB}$  between  $300$  and  $3000 \text{ c/s}$ .

### Discriminator and AF-Unit 5

An AF-signal of  $1000 \text{ c/s}$ ,  $18-22 \text{ mV RMS}$  ( $R_g=100\Omega$ ) applied between T2 and grd. through a  $0.1 \mu\text{F}$  capacitor must cause an output of  $200 \text{ mV RMS}$  between T3 and grd. with the volume control in position 1. The frequency response must be within  $\pm 1-2 \text{ dB}$  for a  $6 \text{ dB/oct.}$  de-emphasis between  $300$  and  $3000 \text{ c/s}$ . For tuning the discriminator apply a  $470 \text{ kc/s}$  signal of  $100 \text{ mV P.D.}$  ( $R_g=50\Omega$ ) between T4 and grd. and connect a  $50 \mu\text{A}$  meter through an external  $220 \text{ k}\Omega$  resistance between T6 and grd. Tune for zero current. A  $\pm 20 \text{ kc/s}$  variation of the  $470 \text{ kc/s}$  signal must cause a deviation of  $\pm 20 \mu\text{A}$  on the meter.

### Squelch-Unit 6

A  $7 \text{ kc/s}$  signal of  $10 \text{ mV P.D.}$  ( $R_g=100\Omega$ ) applied between T7 and grd. shall cause a DC-output between T8 and grd. of  $-4 \text{ V DC}$ .

The simplest and most convenient way to test the rest of the module is to use a diode voltmeter as shown on the previous page.

### Limiter-Unit 4

Connect the diode voltmeter between T5 and grd. and apply a  $470 \text{ kc/s}$  signal of  $100 \text{ mV P.D.}$  ( $R_g=50\Omega$ ). The meter indicator must read about  $30 \mu\text{A}$ .

### 1st and 2nd Oscillator-Unit 2

The diode voltmeter applied between T11 and grd. must indicate  $>9 \mu\text{A}$  for correct 1st oscillator output. The diode voltmeter connected between T10 and grd. must indicate  $>6 \mu\text{A}$  for correct 2nd oscillator output.

### IF-Unit 3

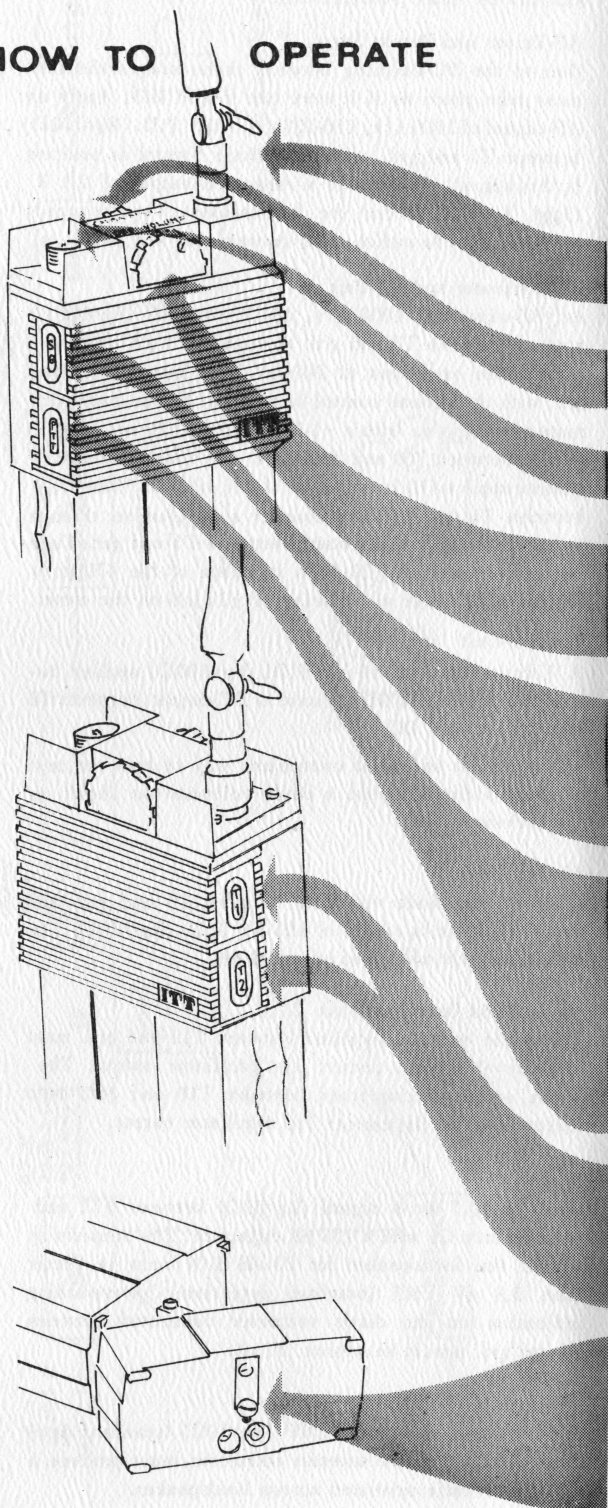
Apply a  $10.7 \text{ Mc/s}$  signal ( $R_g=50\Omega$ ) between T12 and grd.; replace C1 with a  $150 \text{ pF}$  capacitor. The sensitivity across the loudspeaker for  $20 \text{ dB S/N}$  must be better than  $0.8 \mu\text{V EMF}$  (standard deviation). Corresponding indication on the diode voltmeter connected between T5 and grd. should be approx.  $20 \mu\text{A}$ .

### RF-Unit 1

An RF-signal of  $0.8 \mu\text{V EMF}$  ( $R_g=50\Omega$ ) (standard deviation) applied to the antenna connector, must produce a  $20 \text{ dB S/N}$  ratio measured across loudspeaker.



## HOW TO OPERATE



## THE *TransITT-6*

The antenna is to be mounted.

Turn channel selector to correct channel number.

Plug for connection of optional microphone.

Apply power to unit by turning combined main switch and volume control clockwise from „O-position”. Turn to position 3 or 4 for normal audio level.

Built-in squelch circuit eliminates noise from loudspeaker when no carrier is present at the channel.

By pressing squelch switch quieting condition is released and a rushing noise is heard in loudspeaker.

By pressing Push-To-Talk switch power is removed from receiver, power to transmitter is applied, and the antenna is switched to transmitter output.

When PTT-switch is released, receiver becomes operative again.

To transmit a message, hold the set approx. 5 cm (2 inches) from the mouth, press the PTT-switch and speak across the microphone.

Optional: 1 or 2 tones.

For signalling, tone call is available. Press tone switch for call, and power to transmitter is applied. When released receiver becomes operative again.

The battery box can easily be detached from the unit for replacement.

Turn the bottom screw 90 degrees counter clockwise and remove the box.

If wrongly polarized, box will not engage.



# SERVICING

## SERVICING OF THE TransITT-6

The set is built and inspected to such standards that it should really last a lifetime. However, a transistor might once in a hundred years go wrong and therefore, you should read the below story.

The set is subdivided into modules and can, therefore, as regards service and maintenance be regarded as an old fashioned crystal set.

Such a crystal set had very few components: a coil, a variable condenser, a crystal rectifier, a headset, a by-pass condenser, and a blocking condenser. Now if a break down happened in the set, it was easy to localize the fault and remedy it by exchanging the faulty component for a new one. Most components had sockets and plugs to facilitate replacement.

In the present set, the modules should be regarded as components, i.e. the set consists of an RF unit, an oscillator unit, a discriminator etc. If trouble should develop in the set, follow the instructions given on pages 9 & 25 in order to locate the faulty unit and replace it by a new one. Now, just like most people in „ye olden days“ did not throw away a defective component, a defective module in the present set should not be thrown away, but either returned to the supplier for repair or repaired locally.

In case a customer has more than 10 sets in action and has his own service facilities, the repair of a module can economically be made locally using the special test jigs developed for production, service and maintenance

of these units. In this way the maintenance of the units is reduced to very simple procedures.

In the future a world wide service organization will be attempted so that customers not having their own service facilities for repair of modules, but being able to localize defective modules, may ship their modules for repair or replacement much the same way as to-day you ship your colour photos across the continent for development and receive them back a few days later.

The modules are so small and rugged that they can withstand rough treatment even if only scantily wrapped. They are lightweight so that a few cents in postage bring them airfreight around the world should you prefer to ship your unit directly to the manufacturer, who will take pride in returning your repaired unit within 24 hours upon receipt and for a very small nominal charge.

## DISASSEMBLY

To disassemble the equipment the following procedure is recommended:

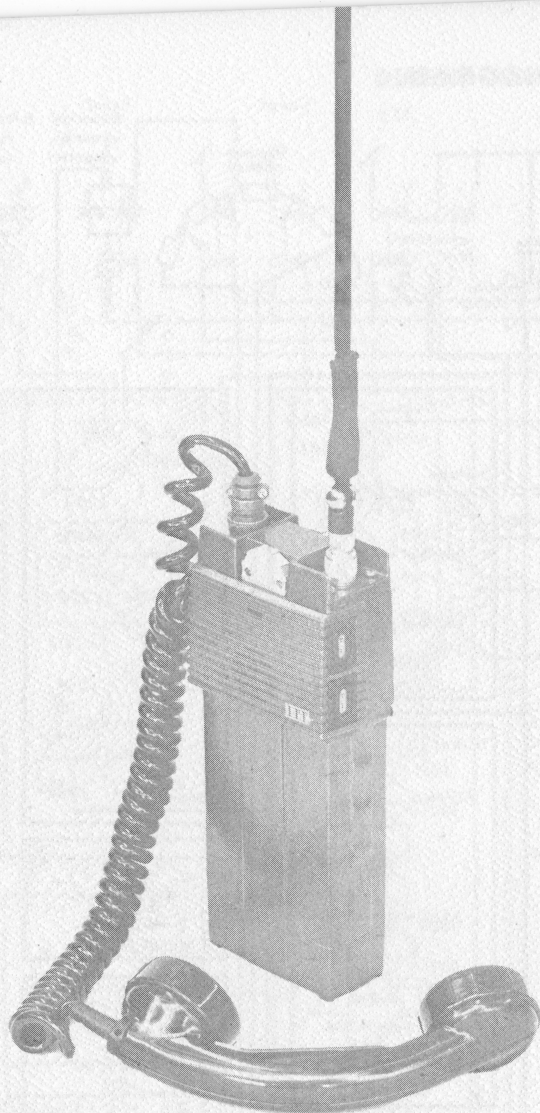
1. Remove the battery box.
2. Unscrew the three screws holding the covers together. (two placed on the rear cover and one at the bottom of the front cover).
3. Unscrew the four screws placed on the top of the equipment.
4. Now pull the covers from each other and at the same time push them away from the top part.
5. Like turning a page in a book, turn the front cover. The procedure is necessary due to the permanent connection of leads between the front cover and the top part. Only the rear cover can be removed, after disconnecting the leads from the battery contacts.

The diagram illustrates a 10-watt transistor radio receiver and transmitter circuit. Key components and sections include:

- Transmitter Section (Left):**
  - Oscillator + Modulator (8):** Uses transistors V801 and V802/V803, with RF and AF outputs.
  - 1st. Multiplier (9):** Uses transistor V901 and inductors L901, L902.
  - 2nd. Multiplier (10):** Uses transistors V1001, V1002, V1003 and inductors L1002, L1003, L1005, L1006, L1008.
- Receiver Section (Center and Right):**
  - Tone Unit (15):** Includes transistors V1501, V1502, V1201, V1202, V1203, V1204 and resistors R1505, R1201, R1209, R1204.
  - RF Unit (1):** Includes transistors V101, V103, V104, V105, V106, V107, V108, V109, V110, V111, V112, V113, V114, V115, V116, V117, V118, V119, V120, V121, V122, V123, V124, V125, V126, V127, V128, V129, V130, V131, V132, V133, V134, V135, V136, V137, V138, V139, V140, V141, V142, V143, V144, V145, V146, V147, V148, V149, V150, V151, V152, V153, V154, V155, V156, V157, V158, V159, V160, V161, V162, V163, V164, V165, V166, V167, V168, V169, V170, V171, V172, V173, V174, V175, V176, V177, V178, V179, V180, V181, V182, V183, V184, V185, V186, V187, V188, V189, V190, V191, V192, V193, V194, V195, V196, V197, V198, V199, V200, V201, V202, V203, V204, V205, V206, V207, V208, V209, V210, V211, V212, V213, V214, V215, V216, V217, V218, V219, V220, V221, V222, V223, V224, V225, V226, V227, V228, V229, V230, V231, V232, V233, V234, V235, V236, V237, V238, V239, V240, V241, V242, V243, V244, V245, V246, V247, V248, V249, V250, V251, V252, V253, V254, V255, V256, V257, V258, V259, V260, V261, V262, V263, V264, V265, V266, V267, V268, V269, V270, V271, V272, V273, V274, V275, V276, V277, V278, V279, V280, V281, V282, V283, V284, V285, V286, V287, V288, V289, V290, V291, V292, V293, V294, V295, V296, V297, V298, V299, V300, V301, V302, V303, V304, V305, V306, V307, V308, V309, V310, V311, V312, V313, V314, V315, V316, V317, V318, V319, V320, V321, V322, V323, V324, V325, V326, V327, V328, V329, V330, V331, V332, V333, V334, V335, V336, V337, V338, V339, V340, V341, V342, V343, V344, V345, V346, V347, V348, V349, V350, V351, V352, V353, V354, V355, V356, V357, V358, V359, V360, V361, V362, V363, V364, V365, V366, V367, V368, V369, V370, V371, V372, V373, V374, V375, V376, V377, V378, V379, V380, V381, V382, V383, V384, V385, V386, V387, V388, V389, V390, V391, V392, V393, V394, V395, V396, V397, V398, V399, V400, V401, V402, V403, V404, V405, V406, V407, V408, V409, V410, V411, V412, V413, V414, V415, V416, V417, V418, V419, V420, V421, V422, V423, V424, V425, V426, V427, V428, V429, V430, V431, V432, V433, V434, V435, V436, V437, V438, V439, V440, V441, V442, V443, V444, V445, V446, V447, V448, V449, V450, V451, V452, V453, V454, V455, V456, V457, V458, V459, V460, V461, V462, V463, V464, V465, V466, V467, V468, V469, V470, V471, V472, V473, V474, V475, V476, V477, V478, V479, V480, V481, V482, V483, V484, V485, V486, V487, V488, V489, V490, V491, V492, V493, V494, V495, V496, V497, V498, V499, V500, V501, V502, V503, V504, V505, V506, V507, V508, V509, V510, V511, V512, V513, V514, V515, V516, V517, V518, V519, V520, V521, V522, V523, V524, V525, V526, V527, V528, V529, V530, V531, V532, V533, V534, V535, V536, V537, V538, V539, V540, V541, V542, V543, V544, V545, V546, V547, V548, V549, V550, V551, V552, V553, V554, V555, V556, V557, V558, V559, V560, V561, V562, V563, V564, V565, V566, V567, V568, V569, V570, V571, V572, V573, V574, V575, V576, V577, V578, V579, V580, V581, V582, V583, V584, V585, V586, V587, V588, V589, V590, V591, V592, V593, V594, V595, V596, V597, V598, V599, V600, V601, V602, V603, V604, V605, V606, V607, V608, V609, V610, V611, V612, V613, V614, V615, V616, V617, V618, V619, V620, V621, V622, V623, V624, V625, V626, V627, V628, V629, V630, V631, V632, V633, V634, V635, V636, V637, V638, V639, V640, V641, V642, V643, V644, V645, V646, V647, V648, V649, V650, V651, V652, V653, V654, V655, V656, V657, V658, V659, V660, V661, V662, V663, V664, V665, V666, V667, V668, V669, V670, V671, V672, V673, V674, V675, V676, V677, V678, V679, V680, V681, V682, V683, V684, V685, V686, V687, V688, V689, V690, V691, V692, V693, V694, V695, V696, V697, V698, V699, V700, V701, V702, V703, V704, V705, V706, V707, V708, V709, V710, V711, V712, V713, V714, V715, V716, V717, V718, V719, V720, V721, V722, V723, V724, V725, V726, V727, V728, V729, V730, V731, V732, V733, V734, V735, V736, V737, V738, V739, V740, V741, V742, V743, V744, V745, V746, V747, V748, V749, V750, V751, V752, V753, V754, V755, V756, V757, V758, V759, V760, V761, V762, V763, V764, V765, V766, V767, V768, V769, V770, V771, V772, V773, V774, V775, V776, V777, V778, V779, V780, V781, V782, V783, V784, V785, V786, V787, V788, V789, V790, V791, V792, V793, V794, V795, V796, V797, V798, V799, V800, V801, V802, V803, V804, V805, V806, V807, V808, V809, V810, V811, V812, V813, V814, V815, V

Squelch  
on-off





Request for information, service, and orders  
for replacement parts should be directed to:

## TECHNICAL SPECIFICATION

### GENERAL

#### Frequency Range

35 - 41 Mc/s (8 m band)

68 - 88 Mc/s (4 m band)

146 - 174 Mc/s (2 m band)

#### Number of Channels

up to 10 locally controlled

#### RF-Bandwidth

2 m band 4 m band 8 m band

1 Mc/s 0.6 Mc/s 0.4 Mc/s

#### Modulation

Phase modulation

6 dB pre- & deem-  
phasis

#### Frequency modulation

optional

#### Channel Separation

50 kc/s, 25 kc/s, or 20 kc/s

#### Temperature Range

(for radio characteristics  
only, not for batteries)

normal -30° - +60°C

optional -40° - +60°C

#### Frequency Stability

between full battery voltage and  
10.5 V and all temperatures above

±2.5 kc/s for 50 kc/s channeling

±1.6 kc/s for 25 kc/s channeling

±1.6 kc/s for 20 kc/s channeling

#### Crystals

2 crystals for each channel.

Separate oscillators for trans-  
mitter and receiver.

#### Battery Types

Nickel-Cadmium chargeable cells.

10 x 225 DKZ for 8-10 hours of service

10 x 500 DKZ for 18-24 hours of service

Dry Cells 18-24 hours of service

#### Transistorization

Full - no tubes at all

#### Dimensions

225 x 85 x 38 mm

#### Weight

Approx. 1 kilo.



# TECHNICAL SPECIFICATION

## RECEIVER

### Sensitivity

better than  
 $1 \mu\text{V EMF } 20 \text{ dB S/N or } 12 \text{ dB } \frac{\text{S} + \text{N} + \text{D}}{\text{N} + \text{D}}$

### Receiver Noise

More than 46 dB below output at standard level and at 10  $\mu\text{V}$  receiver input voltage. Squelched: 50 dB.

### Selectivity

80 dB according to EIA (two signal method)

### Image Rejection

85 dB (EIA method - 20 dB quieting)

### Spurious Response

85 dB (EIA method - 20 dB quieting)

### Interchannel Modulation

64 dB (three-signal EIA-method).  
Optional 70 dB.

### Blocking

British GPO-requirement (no EIA exists)

### Receiver Radiation

Less than 0.002  $\mu\text{W}$   
30  $\mu\text{V}$ /meter at 30 meters

### Distortion at 1000 c/s

Less than 7% for standard deviation  
and 500 mW for type A

### Output for Speaker

0.5 W

### Audio Pass Band

300-3000 c/s (optional 300-2600 c/s)  
+1 to -3 dB ref. 1000 c/s

### Squelch

Adjustable inside the equipment.  
Operator on front panel

# TECHNICAL SPECIFICATION

## TRANSMITTER

### Power Output

0.5 W (2, 4, 8 m bands)

### Maximum Deviation

$\pm 15 \text{ kc/s}$  for 50 kc/s channeling  
 $\pm 5 \text{ kc/s}$  for 25 kc/s channeling  
 $\pm 4 \text{ kc/s}$  for 20 kc/s channeling

### Standard Deviation

$\pm 10.5 \text{ kc/s}$  for 50 kc/s channeling  
 $\pm 3.5 \text{ kc/s}$  for 25 kc/s channeling  
 $\pm 2.8 \text{ kc/s}$  for 20 kc/s channeling

### Distortion at 1000 c/s

Less than 7% for standard deviation

### Spurious Emissions and Harmonics

Less than 0.2  $\mu\text{W}$

### Adjacent Channel Radiated Power

Less than 10  $\mu\text{W}$  for microphone voltage  
20 dB above voltage producing standard deviation

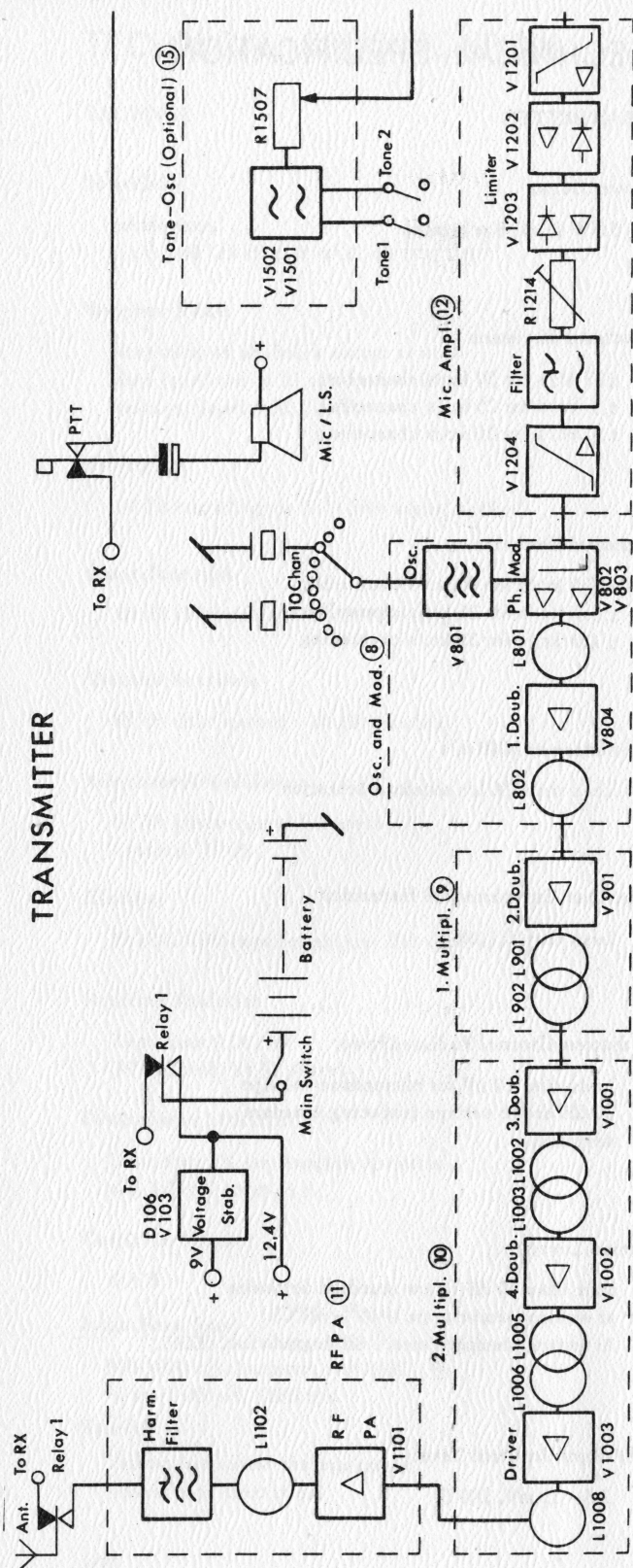
### Noise Level

More than 40 dB below standard deviation  
at ambient temperature (+15° - 30°C).  
At extreme temperatures 6 dB degradation. (EIA).

### AF-Input Standard Level

2.5 - 15 mV, 200  $\Omega$

# TRANSMITTER



## DESCRIPTION OF TRANSMITTER DIAGRAM

### Oscillator and Modulator 8

The first transistor V801 operates as a grounded collector crystal controlled oscillator. The output is tapped through a capacitive divider in the emitter. The balanced modulator is according to the Armstrong-system fed with two RF-signals 90° out of phase. The oscillator signal is fed through a phase lagging network to the emitter of the first transistor (V803) in the modulator and through a phase leading network to the emitter of the second transistor (V802). At the same time the audio signals are fed to the bases of both transistors. They are taken from both ends of a center tapped transformer and are therefore 180° out of phase. The output signal from the modulator is taken out at the collectors, which are connected in parallel, and is passed through a tuned circuit (L801) to the base of the transistor (V804). From the collector the signal, which is twice the crystal frequency in the 4 and 8 meter versions, and which is three times the crystal frequency in the 2 meter version, is taken out across a tuned circuit (L802) and fed to the output terminals of the module.

### 1st Multiplier 9

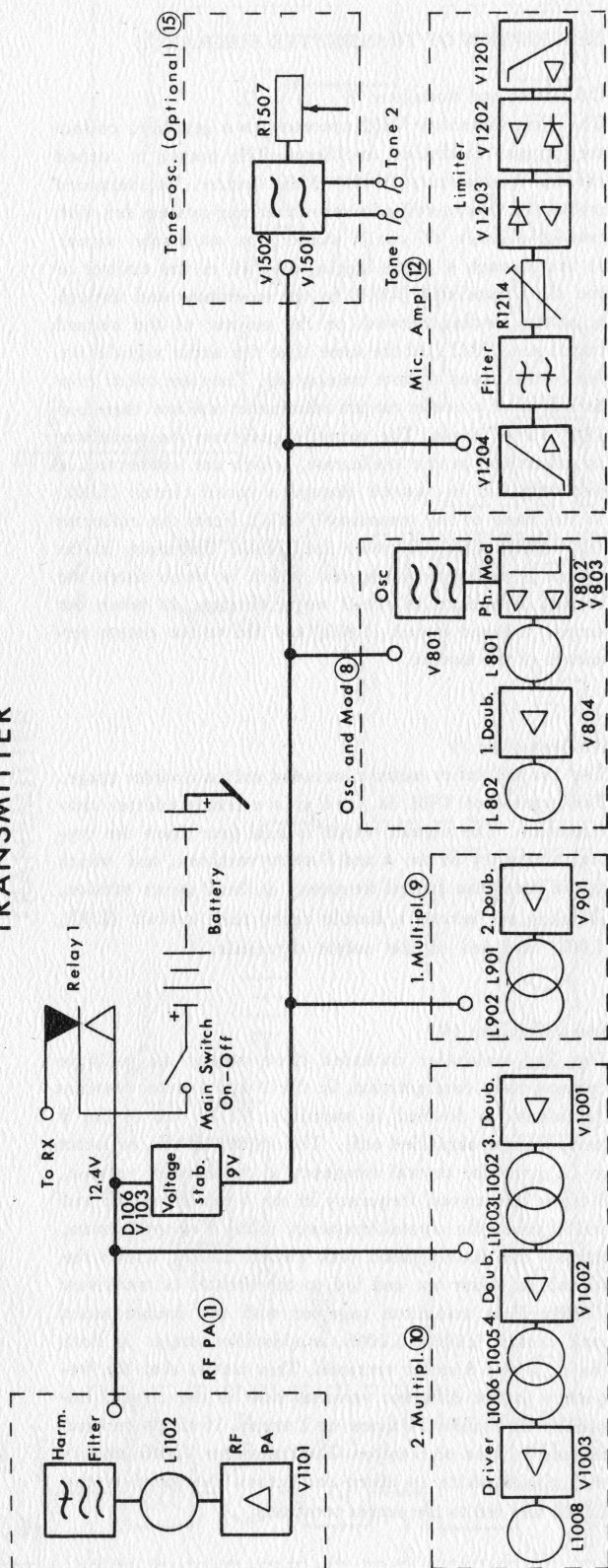
The 1st multiplier module includes only a doubler stage. The transistor V901 is used in a common emitter configuration. The signal, which is now four times the crystal frequency in the 4 and 8 meter versions, and which is six times the crystal frequency in the 2 meter version, is taken out across a double tuned tank circuit (L901, L902) and fed to the output terminals.

### 2nd Multiplier 10

The 2nd multiplier includes three stages all build in common base configuration. In the 2 and 4 meter versions the signal is doubled in transistor V1001 but in the 8 meter version amplified only. The signal on the collector is 12 times the crystal frequency in the 2 meter version, 8 times the crystal frequency in the 4 meter version and still 4 times the crystal frequency in the 8 meter version. Across the double tuned tank circuit L1002, L1003 the signal is taken out and fed to the emitter of transistor V1002. This transistor together with the double tuned tank circuit L1005, L1006, is a doubler stage in both the 2, 4 and 8 meter versions. This means that the frequency in the different versions now is the crystal frequency multiplied 24 times on 2 meter, 16 times on 4 meter and 8 times on 8 meter. The transistor V1003 amplify the signal which is taken out across the tuned circuit L1008 and fed to the output terminals.



# TRANSMITTER



## RF-PA 11

The RF-PA consists of transistor V1101 operating in a common emitter configuration with approx. 6 dB gain. The signal is taken out across a tuned circuit, L1102, in the collector and fed into a filter, having three-m derived T-sections. From the filter the signal is led via the antenna relay to the antenna.

## Microphone Amplifier 12

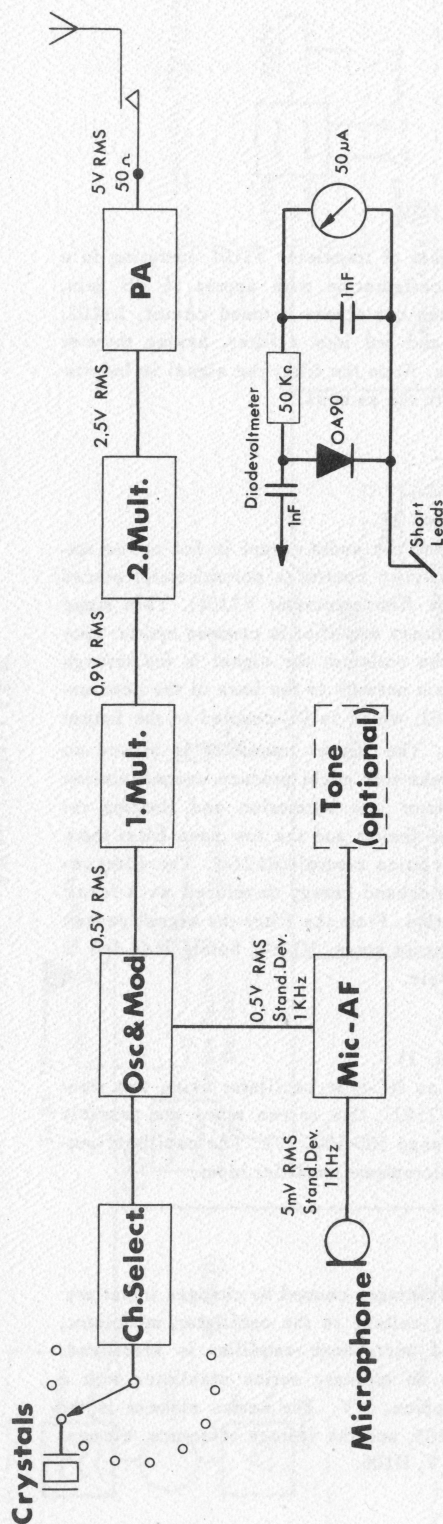
From the microphone the audio signal is fed to the amplifier input sensitivity control (a potentiometer placed in the base of the first transistor V1201). This stage operates as an ordinary amplifier in common emitter configuration. From the collector the signal is fed through an R-C pre-emphasis network to the base of the next amplifier stage, V1202, which is DC-coupled to the limiter transistor, V1203. The limiter transistor is biased so that any audio peaks that might produce overmodulation drives the transistor into saturation and limiting results. Between the limiter and the low pass filter there is a maximum deviation control (R1214). The filter reduces unwanted sideband energy developed as a result of the limiting action. From the filter the signal passes through a de-emphasis stage, V1204, before it is led to the modulator module.

## Optional Tone Unit 15

The tone unit is an RC-type oscillator using two transistors (V1501, V1502). One or two tones are possible in the frequency range 300-3000 c/s. The oscillator output is fed to the microphone amplifier input.

To avoid any disadvantages caused by changes in battery voltage the supply voltage to the oscillator, modulator, 1st multiplier and microphone amplifier is stabilized. The stabilizer is an ordinary series stabilizer with a voltage drop of approx. 3 V. The series element is the NPN-transistor V103, and the voltage reference element a zenerdiode of 9 V, D106.





## TRANSMITTER

### TRANSMITTER TEST PROCEDURE

The simplest and most convenient way to test the transmitter is to use a diode voltmeter as shown on the previous page.

#### Oscillator And Modulator 8

To test the oscillator, connect the diode voltmeter between T1 and grd. The correct output on the meter indicator must be  $35 \pm 10 \mu\text{A}$ . The corresponding V.T.V.M. indication should be  $1.7 \pm 0.5 \text{ V. RMS}$ . Between T2 and grd. the respective indications should be  $10 \pm 2 \mu\text{A}$  and  $0.5 \text{ V. RMS}$ .

#### 1st Multiplier 9

Connect the diode voltmeter between T3 and grd. For correct output the meter indication must be  $10 \pm 2 \mu\text{A}$ . The corresponding V.T.V.M. indication must be  $0.5 \text{ V. RMS}$ . Connect the diode voltmeter between T4 and grd. For correct output the meter indication must be  $15 \pm 3 \mu\text{A}$ . The corresponding V.T.V.M. indication must be  $0.9 \pm 0.2 \text{ V. RMS}$ .

#### 2nd Multiplier 10

Connect the diode voltmeter between T5 and grd. For correct output the meter indication must be  $15 \pm 3 \mu\text{A}$ . The corresponding V.T.V.M. indication must be  $0.9 \pm 0.2 \text{ V. RMS}$ . Connect the diode voltmeter between T6 and grd. For correct output the meter indication must be  $50 \pm 5 \mu\text{A}$ . The corresponding V.T.V.M. indication must be  $2.5 \pm 0.5 \text{ V. RMS}$ .

#### RF-PA 11

The correct output is  $0.5 \text{ W}$  into  $50 \Omega$ . Connect a wattmeter between T7 and grd. for test.

#### Microphone AF-Unit 12

Apply an AF-signal between T8 and grd. of  $1000 \text{ c/s}$   $2.5\text{--}15 \text{ mV. RMS P.D.}$  ( $R_g=200 \Omega$ ). The signal is dependent on the position of the input sensitivity control R1201. Measured between T9 and grd. this signal shall cause an output of  $0.5 \text{ V. RMS}$ . For the symmetry and maximum deviation test, a deviation-meter is required. Tune R1209 for symmetry and R1214 for maximum permissible deviation.

During all tests the supply voltage shall be  $12.4 \text{ V.}$

