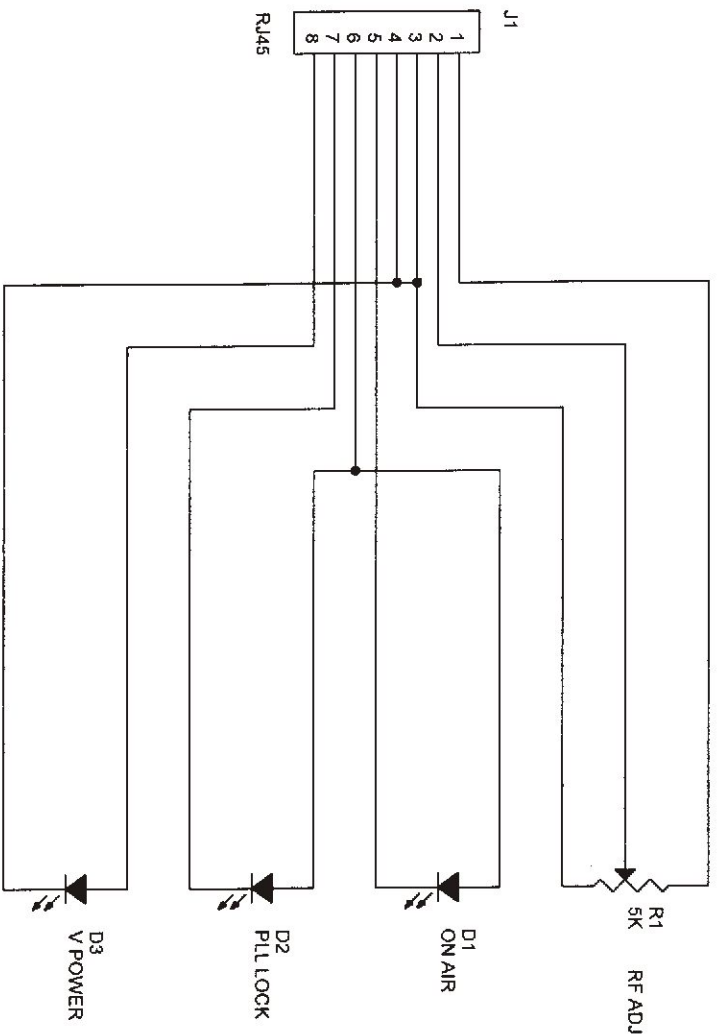




Title		FRONTAL PANEL	
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The basic operational circuit consists of the following blocks:

- Power Supplies;
- Audio circuits;
- Modulated Oscillator;
- PLL;
- Power Amplifier;
- Control-Interface Unit.

Power Supplies.

This module comprises a switching power supply which the voltage input can change in automatic mode between 110VAC and 220 VAC.

The output voltage is stabilized at the +48 VDC that supplies at the RF power amplifier, a DC-DC power supply reduce the tension to +15VDC to supplies the RF driver and also several voltage regulators, mounted on the main board, supplies the +12V (U13), -12V (U10) and +5V (U14) at other internal modules.

Audio input circuit.

The purpose of this circuit is to combine MONO and sub-carrier SCA (1,2 and 3) or MPX and sub-carrier SCA (1,2 and 3) signals and adjust the modulation level by amplification to the correct level for driving the modulated oscillator.

In the mono circuit the signal is amplified through the integrated circuit U8 and a jumper J9 selected the pre-emphasis from 50µS to 75µS.

The circuit gain can be varied through the trimmer R80 which in turn changes the mono deviation level.

The operational amplifier U6 amplify the Mono, MPX and sub-carrier signal.

The levels of the sub-carrier and MPX signals can be varied by trimmer R45, R51, R53 and R59.

The operational amplifier U7 is a buffer amplifier which drivers the audio rectifier diodes D14, D15 and D13.

This signal is connected to the microprocessor through ADC circuit to display the deviation level, and using the trimmer R54 this can be set.

Modulated Oscillator.

The modulated oscillator generates a RF signal in the 87.50 to 108.00 MHz band.

The amplifier U2 (U3 optionally) supplies two signals, one is used to drive the RF power stage and the other as a part of the PLL and frequency feedback.

The transistor Q1 with the coaxial cable (COAX1) and the varicaps diode (D3÷D8) form the oscillator circuit.

The PLL circuit control changed the varicaps capacitance from the oscillator circuit.

The audio circuits produces through the C20 and R12 the deviation of frequency.

The oscillator circuit is mounted in a self contained box for isolation from the other circuit of the exciter, since this is the most sensitive part of the equipment.

PLL.

The PLL ensures modulated oscillator maintains the correct output frequency.

The RF signal from the oscillator circuit is compared by the frequency synthesiser U4.

The reference oscillator is guaranteed by a 12.8MHz TCXO with a precision of 2ppm.

The integrated circuit U4 control the output frequency stability and the microprocessor generate the data to program the frequency.

Power Amplifier.

It is composed by an RF transistor driver MRF237 (or equivalents) and a double push-pull type RF power MOSFET transistor BLF278 by Philips which is able to develop up to 300W RF Power.

A circuit controls that the output power doesn't change with the temperature and another circuit regulates the voltage supplied at the transistor Q3 for the control of the output power.

The incident power directional coupler and the reflected directional coupler supplies a voltage proportional to RF output power and to RF reflected power.

These tensions are connected to the ADC integrated circuit in order to be displayed.

When the reflected RF output power exceeds 20W the control output power circuit reduces the RF output power to maintain the reflected power to this level.

When the PLL unlocks a circuit cuts off the RF output power both at the RF power control and at the GATE control.

The GATE control voltage goes negative both when the PLL unlocks and when the interlock is connected to ground voltage.

A low pass filter reduces the harmonics frequencies at proper levels.

Control-Interface Unit.

A microprocessor supervises at the stored frequency, at the protection of frequency with password and to display the parameters.

Three channels ADC are used to display the parameters:

Modulating level;
Forward power;
Reflected power.

When the user changes the frequency the microprocessor controls that the RF output power switches off before that the PLL is unlocked.

During the operation to locking the RF output power is put off.
After that the PLL is locked the RF output power switch on.

Option 01.

An RS232 port to connected at PC controls in remote mode all the functions of the equipment.

It is possible to change the frequency, read the levels of the forward power, reflected power, modulation and switch on/off the equipment.

GENERAL

Caution it is advisable to remove power from the unit prior to servicing to avoid possible shock to personnel or damage to the unit. This kind of apparatus was designed to operate reliably under continuous duty conditions with a very minimum of maintenance. The only recommended maintenance is that of periodic cleaning of the unit to ensure that all air passages stay free of dirt and contamination. The printed circuit boards should also be cleaned by blowing the dirt off with air pressure. Do not use solvents to clean the unit as they may cause damage to some of the components or finish of the unit.

INTEGRATED CIRCUITS

All integrated circuits has been made easy by the use of sockets for these devices. An IC puller tool is recommended for removing the IC chips and an insertion device is recommended for replacing the chips to prevent bending the pins. When replacing the chips insure that all pins on the chip are matched up with the socket pins. Firmly push the chip into the socket to insure good contact.

RF AND POWER TRANSISTORS

To replace RF and power transistors, a few tools will be required as the devices are soldered and bolted into the unit. To unsolder the devices always use approved desoldering tools such as solder wick and solder suckers. In the case of RF transistors, after removing the solder, carefully lift the tabs clear of the board being careful not to damage the foil on the printed circuit board. Make a diagram of all components removed to ensure their proper replacement in the exact positions from which they came. When replacing components use Dow Corning 340 heat sink compound or equivalent on the power device for proper transfer of heat to the heatsink. Use good soldering practices when resoldering the devices back in. When soldering is complete use an approved solder flux remover to clean up the area where the component was replaced. Always inspect the power device carefully for insulating hardware which electrically insulates some of the devices from the chassis ground. These will be found on the power transistors and regulators in the power supply. This hardware must be replaced for the device to work properly.

SMALL COMPONENTS

Small components such as resistors, capacitors and small transistors and diodes should be removed very carefully using good desoldering tools. Always observe the polarity of diodes and electrolytic capacitors and make a small note to ensure that the replacement device is installed properly. Diodes installed wrong may cause damage to other components and electrolytic capacitors may explode if polarity is not observed. When removing small components the component may be crushed with a pair of pliers and each lead carefully removed. The important item is not to damage the printed circuit board. The damage most likely to occur is the lifting of a foil or the removal of the plated material on a plated through hole in the board. If it is suspected that the plated through material has been damaged, the component lead may be soldered on both sides of the board.

Before being shipped, each apparatus must pass a 48 hour quality control test. Most failures can be detected by means of intermittent operation during this test. Nevertheless, a component may fail, but only after a longer period of operation.

NEXUS BROADCAST Warrants that all products of its own manufacture conform to NEXUS BROADCAST specifications and are free from defects in material and workmanship when used under normal operating conditions and within the service conditions for which they were furnished.

The obligation of NEXUS BROADCAST hereunder shall expire one (1) year after delivery and is limited to repairing, or at its option, replacing without charge, any such product which in NEXUS BROADCAST'S sole opinion proves to be defective within the scope of this warranty.

This is NEXUS BROADCAST'S sole warranty with respect to the products delivered hereunder. No statement, representation agreement or understanding, oral or written, made by an agent, distributor, representative or employee of, which is not contained in this warranty will be binding upon NEXUS BROADCAST, unless made in writing and executed by an

NEXUS BROADCAST makes no other warranty of any kind whatsoever, expressed or implied, and all implied warranties of merchantability and fitness for a particular use which exceed the above stated obligation are hereby disclaimed by NEXUS BROADCAST and excluded from this agreement. Under no circumstances shall NEXUS BROADCAST be liable to Buyer, in contract or in tort, for any special, indirect, incidental or consequential damages, losses or delays however caused.

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT

NEXUS BROADCAST must be notified in writing of the defect or nonconformity within the warranty period and the affected product returned to NEXUS BROADCAST'S factory or to an authorized service center within thirty (30) days after discovery of such defect or nonconformity. Shipment shall not be made without prior authorization by NEXUS BROADCAST.

All shipments to NEXUS BROADCAST, should be sent prepaid. The instrument should be shipped in the original packing carton; or if it is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the instrument should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material.
