MORROW M B-565

TRANSMITTER

MORROW MB-565 GENERAL DESCRIPTION

1.0 V.F.O. 12AT7

The Variable frequency oscillator is of the series tuned type or Clapp oscillator. The oscillator is always operating on one half the carrier frequency, except on 3.5 to 4.0 MC, when the transmitter is operating on 7200 KC the oscillator is on 3600 KC. On 3.5 to 4 MC the oscillator is on the carrier frequency.

1.1 With the oscillator operating on one half the carrier frequency, five oscillator ranges are needed to cover the five bands, 10-15 20-40-75 meters. The five ranges allow the dial to be calibrated over its' full length for each band.

1.2 The calibration on each band is very close to the indicated frequency on the dial because the inductance and capacity are adjustable for each range. Each range also is individually temperature compensated for a wide range of temperature variation.

1.3 As in the case of most frequency meters, a calibration control is provided to allow the precise setting of the dial calibration. This control is on the front panel and is identified by the panel marking: CAL.

1.4 To set the calibration, tune a signal of known frequency on the receiver. Set the transmitter dial pointer to this frequency. Adjust CAL until zero beat is obtained.

2.0 Cathode follower 6AN8/2
The output of the oscillator is fed to the grid of the cathode follower. This stage helps isolate the VFO from the balance of the transmitter and makes possible excellent oscillator stability. The cathode follower also changes the high impedance of the oscillator to a low impedance for driving the stage that follows.

3.0 Crystal Oscillator 12AT7/2
This oscillator is of the modified Pierce type and is used for frequency control where net operation is desired, for novice operation, CD and other special services.

3.1 The oscillator uses crystals that are ground for 3500-4000 KC. 7000-7425 KC and 10500-10725 KC. The chart below shows the recommended crystals to use with the different bands.

3.2

3500-4000 KC	use crystal in 3500-4000 KC
7000-7300 KC	use crystal in 3500-3650 KC
14000-14350 KC	use crystal in 7000-7175 KC
21000-21450 KC	use crystal in 10500-10725 KC
28000-29700 KC	use crystal in 7000-7425 KC

3.3 The output of the crystal oscillator is coupled to the cathode of the cathode follower and in turn is coupled to the grid of the next stage.

4.0 Class A Amplifier 6AN8/2
The class A amplifier is used to further isolate the VFO from the balance of the transmitter. This stage operates straight through on the oscillator frequency. The amplifier is stabilized by operating its' grid circuit from the low impedance of the output of the cathode follower.

4.1 The plate circuit is tuned by the second section of the VFO tuning condenser. On 3.5-4.0 MC the plate is coupled to the next stage without tuning and an RF choke is used for the plate load. On the four higher frequency bands separate adjustable coils with tuning taps to allow for tracking, couple the selected frequency to the following driver doubler.

5.0 Driver Doubler 5763
The driver doubler is a power sensitive tube, requiring small input voltages to deliver at all times ample power to the grid of the following tube.

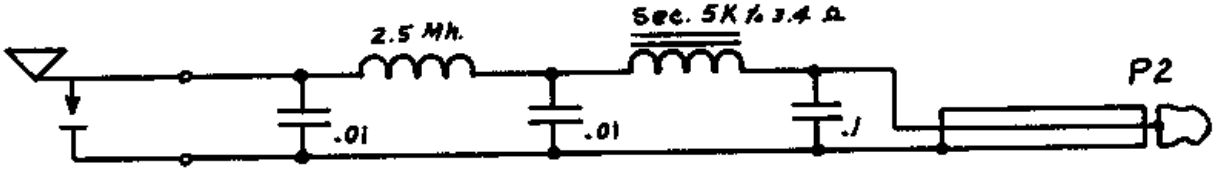
5.1 While its' prime function is a driver, it also doubles the frequency to the carrier frequency. The tuning of the output circuit is done by the grid coils of the following stage. The oscillator frequency is not affected by the drive level setting of this tube for the next stage, nor by its' tuning.

5.2 Transmitter keying is in the screen circuit. A key click filter should be installed on the key when CW operation is desired. See diagram below, 5.4

5.3 The drive level control adjusts the screen voltage for the required grid current on the following power amplifier. The drive across the band is constant at 2 ma, and when set, needs no further attention.

5.4 2.5 Millihenry, Secondary 5000-ohm 3.4-ohm Output Transformer

KEY CLICK FILTER



6.0 Power Amplifier 6146
Because of its' small size and excellent operating characteristics, a 6146 was chosen for the power output tube. The tube is operating as a completely stable circuit with no interaction between the output tuning and the grid circuit.

6.1 The cathode circuit carries the metering for the plate current. A 4.7 ohm resistor in a series with the cathode, allows a voltage drop that is a function of the plate current. By reading the voltage drop across this resistor with a meter that is calibrated in MA, a plate current reading is obtained. While this reading is the combined plate and screen, for all practical purposes the screen current may be ignored. The cathode is bypassed at four points to keep it as close as possible to ground.

6.2 The grid circuit is tuned to the same frequency as the plate and the amplifier at all times runs straight through. The grid tuning is done by the third section of the VFO tuning condenser and the whole exciter is gang tuned, with one control. The tuning condenser either tunes the complete coil (to get the proper LC ratio) or it tunes a tap. The tracking of the tuning on all bands is very close and and is possible because of the adjustable cores in each grid coil.

6.3 The tube is grid neutralized by the capacitors that bypass the lower end of each grid coil to ground. Each band is separately neutralized and any band may be adjusted without changing the others. The 3.5 and 7.0 MC bands are set with fixed condensers while adjustable elements are used for 14-21-28 MC. While it is possible to operate this tube without neutralization, for perfect results it must be neutralized.

6.4 The grid bias is partly fixed and partly from the grid leak. When the unit is used for mobile service, a 67.5 volt battery is used. It will be noted that this battery also supplies bias for the modulator. The OFF-ON switch is used to open the battery circuit when OFF to save battery batterv life. When a RVP-260B power supply is used for the exciter, the 67.5V Bias is supplied from the power supply.

6.5 When the transmitter is used with an AC power supply, the bias is furnished from a voltage regulated source.

6.6 When the meter switch is in the grid position, power amplifier grid current will be indicated on the meter. (meter full scale is 5 MA). The drive control should be used to set the current to 2 MA for proper operation of the amplifier. Because the amplifier is not critical to grid current, small variations of current due to power supply changes may be ignored. The grid current should never be less than 1 MA or more than 3 MA.

6.7 When operating phone the screen voltage is obtained from the high voltage power supply thru a series of dropping resistors. When operating CW the screen voltage is obtained from the 210 volt regulated supply thru R16.

6.8 When the operation switch is in tune position a 100,00 ohm resistor is inserted in the screen circuit. This allows the transmitter to be tuned with the plate current limited to safe values. After the plate tuning condenser is dipped, the meter must be set on OPR before adjusting the loading.

6.9 The screen meter should read less than 8 MA at all times. The only reason for higher reading, would be in case the drive was too high or the plate loading is too low. Full scale meter reading in screen position is 20 MA.

6.10 The screen dropping resistors must be adjusted for different plate voltages. The chart below indicates the proper values of resistance for different plate voltages. The resistor values are chosen to allow the proper size for any usable plate voltage. To adjust the values of resistance, jump the resistors as indicated.

6.11

Plate voltage	Resistance	Jump resistors#
500-600	56,000	none
450-500	51,000	R20
400-450	38,000	R18
400	33,000	R19 & R20
350-400	33,000	R19 & R20
300-350	23,000	R17 & R18

6.12 The power amplifier plate circuit is a shunt fed Pi network. A small capacitor C33 feeds a small amount of Rf back to the grid circuit for neutralization. The components R12-L21 are parasitic suppressors. The capacitor C40 is the coupling element between the tube and the output network.

6.13 The plate current metering is accomplished in the cathode as previously explained, 6.1.

6.14 The output network is designed to work the plate of the tube into a 50-70 ohm load. This load was chosen due to the wide usage of this impedance. If other impedances are desired, an antenna tuner or balun coils should be used.

6.15 The plate tuning is done with a two gang condenser CV4-CV5, The section CV4 is a small capacitor and is used for tuning the 14-21 & 29 MC bands. Its' small size allows a degree of band spread over these ranges.

6.16 The section CV5 is switched in parallel with CV4 by S7A on the 3.5 & 7.0 MC bands. When the transmitter is on the 4.0 MC band, it is possible to set the capacity of the plate condenser, near open, and get 7.0 MC output. This should be avoided at all times and care should be exercised to be sure the capacitor is on the high capacity dip, knob to the right. The other bands will not have this characteristic.

6.17 The inductance L23 is tapped for the different bands. The switch S8A picks the taps as needed. The switch S7A and S8A are on the same shaft and are controlled by a lever from the main wave band switch knob.

6.18 The course load control is a tap switch S9 with a series of six 250MMFD capacitors. As the control is rotated to the right or Clockwise, the capacitors are dropped one at a time. Turning the control to the right increases the loading into the antenna or load. As these capacitors are shunted from the antenna connector to ground, larger capacitors may be installed external to the transmitter if lower impedances are desired however, this cannot be carried too far because of the fixed value of L23. While this is not necessary with 50-70 ohm non-reative loads, and not recommended, it is brought up because of some condition that may exist in the field.

6.19 The fine load control is a tap switch S10 with a series of four 25 MMFD one 50 and one 100 MMFD capacitors. As the control is rotated to the right the 4-25 units are dropped one at a time and then the 50 and 100 are dropped.

6.20 With the two load controls a wide range of capacities are available With both control full left, the maximum capacity is 1750 MMFD. With both controls full right, the capacity is zero, except for stray wiring capacity. With the coarse control over two steps, the capacity would be 1750 less two 250 units or 1250 MMFD.

7.0 The antenna relay is a double pole double throw unit. One set of contacts, switches the antenna to the receiver or the transmitter and the other set of contacts, switches B plus from the exciter to #3 pin on J7 for use of the B voltage on the receiver. When a MORROW MB-6 receiver is used with the transmitter, the receiver power supply, supplies the exciter B plus and the cables take care of these interconnections.

7.1 The relay coil is energized through the microphone push-to-talk switch by the battery, either 6 or 12 volts, when mobile. The 12 volt cables have the relay coil dropping resistor in the plug cap. When the AC power supply is used, a full wave bridge rectifier supplies 6 volts DC for the antenna relay coil as well as the high voltage relay mounted in the power supply.

7.2 When the transmitter is used for CW, a transmit-receive switch should connected to pins #4 and 5 on J7, or to pins #3 and shell on mike jack J1. This will close the relay when the switch is turned to the transmit position. See diagram under installation 3.4.

8.0 The antenna fitting is a standard 83-1R and the plug is a PL 259. The receiver antenna connector is a standard auto radio fitting.

9.0 The MORROW MB-565 transmitter used high level plate and screen modulation. The amount of audio available in the modulator is far more than the amount needed for 100% modulation insuring ample talk power for mobile service.

9.1 Push-pull 6AU5 tubes operating class AB' are used for modulators. The screens of these tubes are regulated for maximum qutput. Modulator plate current readings are taken from a 4.7 ohm resistor in the cathode circuit, as in the RF power amplifier. Because no grid current is drawn with tubes operated class AB', resistance coupling is used in the grid circuit.

9.2 Modulator bias is obtained from an external 67.5 or 75 volt regulated source. The modulator plate current is set to 40 ma with no audio input by the bias control mounted on the back of the transmitter.

9.3 A 12AT7 is used for the driver and phase inverter. The modulation level control is in the grid circuit of the audio amplifier section.

9.4 The voltage amplifier is a 6AV6. Its' grid circuit is terminated on the microphone socket and by the use of jumpers in the microphone plug either crystal or carbon microphones may be used with no changes being necessary in the transmitter.

9.5 A crystal or dynamic microphone is recommended for home station use. A push-to-talk switch is recommended for this service because of the added convenience.

9.6 A carbon microphone should be used for mobile service and we recommend a MORROW MK-N1 microphone. Other microphones may be used, however, the MK-N1 uses a Western Electric N1 unit and is highly recommended. Microphone information is covered later in this book under Installation.

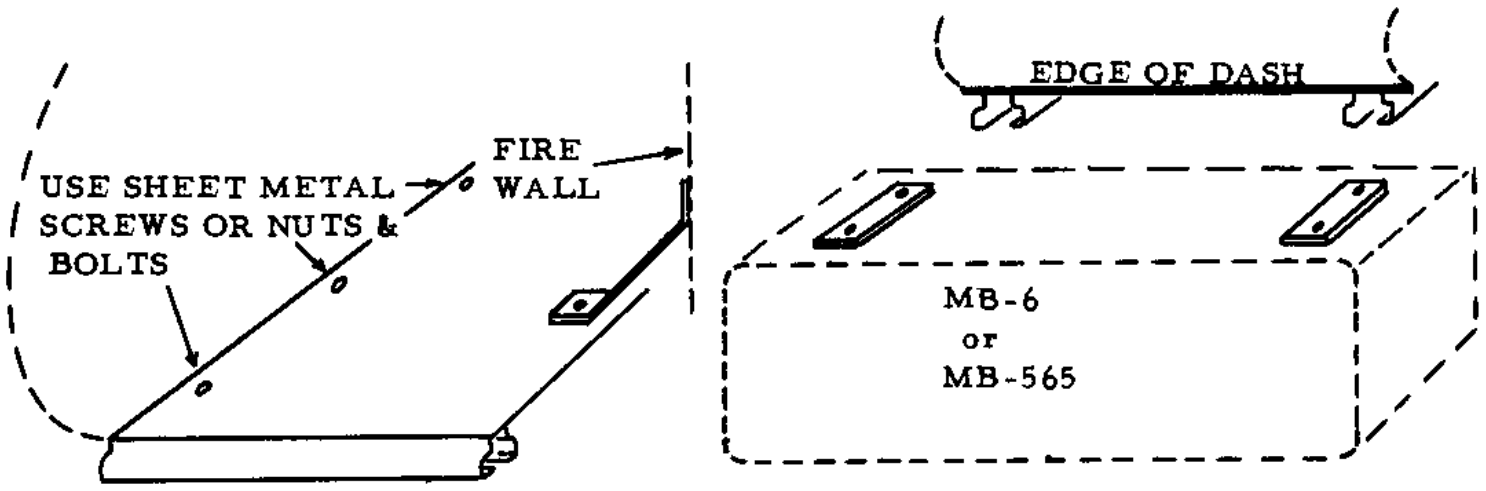
INSTALLATION

0.0 The installation of the MB-565 transmitter has been made as easy as possible. It is a companion unit for the MB-6 receiver and when the two are used together, special slide-in JIFFY MOUNTS make the job simple to install and easy to remove for use in the home.

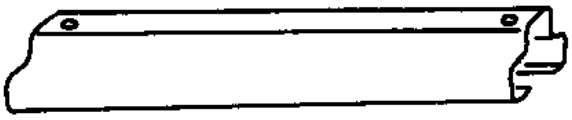
0.1 The MORROW JIFFY MOUNTS are two slide bars, mounted on top of the transmitter cabinet that slide into two receptacles mounted either under the mounting plate or the receiver. When the two units are used, it is suggested the receiver be mounted on top of the transmitter.

0.2 The mounting plate with the two receptacles should be fastened to the lower edge of the dash. The back of the plate should be connected to the fire wall as per drawing 0.3. The plate should be solid because the transmitter and receiver are suspended below.

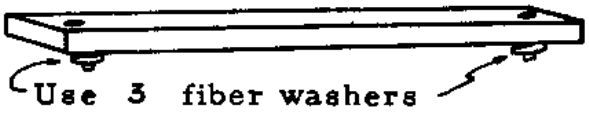
0.3 MOUNTING ILLUSTRATIONS



(cut away view of dash)



(Receptacle)



(Slide Bar)

The slide bars are spaced from the chassis by 3 fibre washers and they are attached by flat headed screws enclosed. The receptacles are attached to the mounting plate by filister head screws. The mounting plate is mounted underneath the dash as shown in a convenient location for use of the MB-6 receiver The receiver will then slide into place and can readily be removed for home or portable use The companion MB-565 can be mounted directly below the MB--6.

0.4 The exciter power supply, or receiver power supply when both are used, should be mounted on the fire wall inside the car. Be sure the supply is mounted so the cables can be left with some slack after they are plugged in.

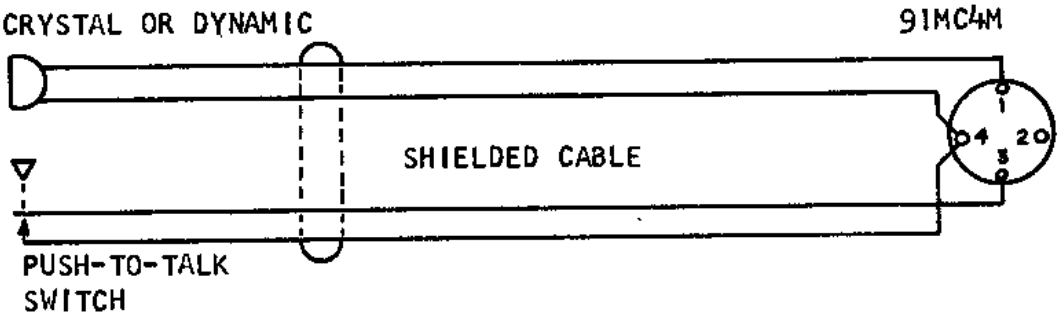
0.5 The JIFFY MOUNTS are bolted to the cabinets with spacers holding the bar off the cabinet and the receptacles tight against the cabinet. Use the screws supplied and be sure there is a minimum of bolt protruding beyond the nut inside the cabinet.

0.6 When the transmitter is used in the home the JIFFY MOUNTS need not be removed. When the receiver is also used in the home, the two units may be connected together with the jiffy mounts and they both slide under the power supply speaker assembly (Model RTS-600S) making a complete home station and one that is small enough for portable work.

1.0 Microphone (Crystal)
A crystal or dynamic microphone is recommended when the wide pass-band audio system is used. The microphone should be on a push-to-talk stand or a push-to-talk switch should be mounted in a convenient location.

1.1 The microphone cable should be shielded and if the push-to-talk switch is included in the microphone stand, a separate pair should be run for it. The shield wire and the pair may be in one cable; however, the wires to these two units should not use a common conductor. See diagram 1.2.

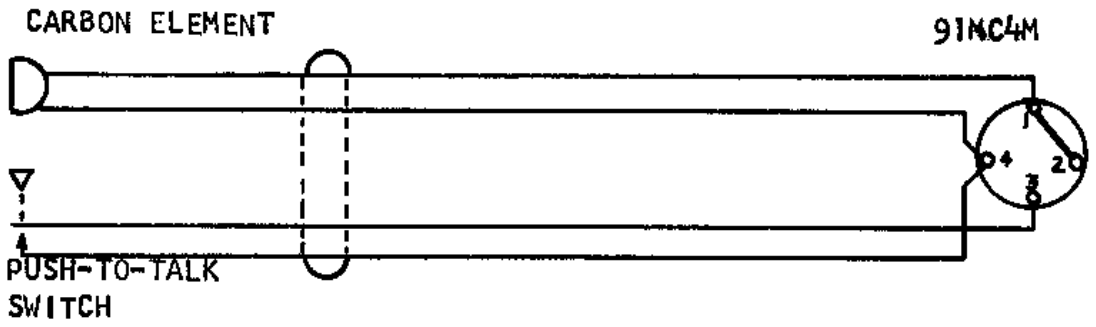
1.2



2.0 Microphone (Carbon)
For restricted range audio or mobile operation, a carbon microphone is recommended. For restricted range audio, the frequency range is with-in limits of the microphone and no advantage will be gained in the use of a crystal unit. For mobile operation, a crystal microphone is definitely not recommended because of the heat problem and unit damage.

2.1 With a carbon microphone the mike cord may or may not be shielded. In any case, separate pairs should be run for the microphone unit and the push-to-talk switch. See diagram 2.2

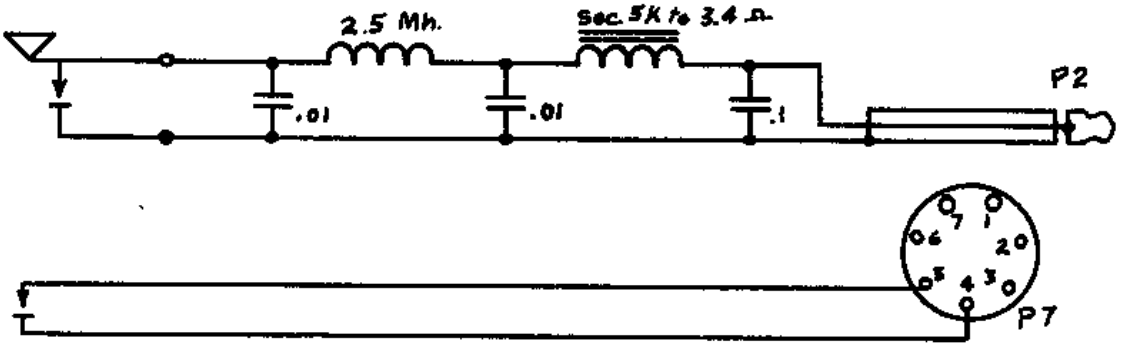
2.2 The element may be a Western Electric F1 or N1 or equivalent.



3.0 Key.
The key should be connected to a standard earphone plug through a key click filter as shown in 3.2.

3.1 A receive-transmit switch should be connected to pins #4 and #5 on jack J7. These connections can be made by removing the cap on the cable. The switch may be mounted on the key base or any convenient location. Some operators like a foot switch mounted under the operating table.

3.2 KEY CLICK FILTER



4.0 Power supply requirements.
The MB-565 is designed to be used with an external power supply. The external power supply may operate on 6 or 12 volts DC or 115 volts, 60 cycles AC.

4.1 The following paragraphs will describe the use of the MB-565 with a 6 or 12 volt power source. The 115V, 60 cycle operation will be covered in later pages.

4.2 Power supply voltages needed.
1. Six volts DC at 6 amp or twelve volts DC at 3 amp is needed to heat the filaments.

2. Six volts DC at 500 ma or twelve volts at 500 ma is needed to operate the relays. The relay in the transmitter requires 6 volts at 250 ma, and the external relay that controls the dynamotor solenoid and opens B plus, makes up the additional power required.

3. 67.5 volts DC at 1 mill or less is needed to supply bias to the final amplifier and modulators. While the current drain is very small, the voltage should be well regulated such as by a battery. Burgess XX45 or Eveready 467. Voltage regulated supplies may be used such as the MORROW RVP-2608 or RTS-600.

4. 275 volts DC at 90 to 100 ma is needed for the exciter. This power may be taken from the receiver power supply. When the transmitter is used with a MORROW M8-6, the power cable plugs into a socket on the power supply which makes this connection without change except for the removal of a jumper in the receiver power supply socket, from pin 2 to 3. This jumper is in the 8 plus circuit and when it is removed, it allows the power to go to the transmitter antenna change-over relay for switching from the receiver to the transmitter. In case the receiver is not used, any 275 volt 100 ma power supply may be used. It is important that 275 volts be applied to the transmitter, because if the voltage is low, the drive on 10 meters may be down. The section dealing with the power supply cables gives information required for connection to any power supply.

5. The high voltage power supply should have 400 to 600 volts available for the power amplifier and modulator. The current requirements are such as to need approximately 200 ma of current available. The final will draw about 116 ma and the modulator resting current is 40 ma, making a total of approximately 160 ma. The modulator peaks run run this up to about 200 ma.
Either a dynamotor or a vibrator power supply MORROW TV-600A or RTV-630, may be used for this supply. It will be noted on the diagrams following, that a relay is used to control the dynamotor relay and to cut the high voltage when the push-to-talk button is released. Most dynamotor relays require too much current for the push-to-talk switch switch contacts and the control relay is required. The 8 plus set of contacts stop the dynamotor whine in the receiver while the motor is coasting to a stop. With MORROW power supplies all relays are built into the equipment.

4.3 Power plug pins, and where they go.
While this information is on the diagram the following should be of some help in understanding the reason for the connections as they are.

J6 8 pin plug.
#1------8 minus or ground for high voltage source.
#2------8 plus from high voltage source.
#3------Relay power source.
#4------Ground for connecting filaments in series or parallel.
#5------Relay control for dynamotor control relay or high voltage relay for AC operated unit.
#6------Center of series filament string. To power source on 6 volt application. Open on 12 volts.
#7------High side of filament string to power source on 12 volts. Ground on 6 volts D.C.
#8------6 or 12 volt DC power from OFF-ON switch to heater string thru jumpers. Not used on 115 volt 60 cycles.

J7 7 pin plug.

#1 DC power input on 6 or 12 volts. One side of main OFF-ON switch on DC or AC.

#2 B plus input for 275 volt supply.

#3 B plus output to receiver.

#4 Push-to-talk circuit. Ground to close relays.

#5 Ground or B minus for 275 volt B supply, relay ground for CW transmit switch, ground for relay power on AC supply, ground or plus side of bias battery.

#6 Bias input-67.5 to 75 volts.

#7 Main off-on switch return.

5.0 Power supply connections: MOBILE.
The MB-565 transmitter is designed to be operated on 6 or 12 volts DC or from 115 volt 60 cycle power lines. The power supplies are separate units connected to the transmitter with connecting cables. Several types of cables are available making the connections as simple as possible. The cables with diagrams are listed on the next few pages showing several possible installations.

The MB-565 is a companion unit to the MORROW MB-6 receiver. A common power supply, MORROW RVP-260B is designed to operate the receiver and transmitter exciter or it may be used to operate either equipment without the other. The following pages show the connections and the proper cables to be used. In case the cables are not on hand, the following pages show the diagrams of the cables so that they may be made up from standard parts found in any radio supply store.

6.1 X A D.C. Combination low and high voltage power supply is available. MORROW RTV-630, that will operate both the receiver and transmitter. One cable is supplied with the power supply for connection to both units. The power supply is complete with all relays etc. The input is 12 volts DC with outputs of 300 volts at 100 MA and 600 volts at 200 MA. These powers can be obtained simultaneously. Bias, 75 volts regulated, is also supplied.

6.2 A power supply for 115 volt 60 cycle with a built in speaker MORROW RTS-600S is available for AC operation of the equipment. This power supply will deliver 275 volts 600 volts and 75 volts for the operation of the MB-565 and the MB-6 as a fixed station or portable unit. This unit is complete with relays, etc.

7.0 CABLES FOR EQUIPMENT GROUP "A"
COMPLETE MORROW INSTALLATION

EQUIPMENT USED:

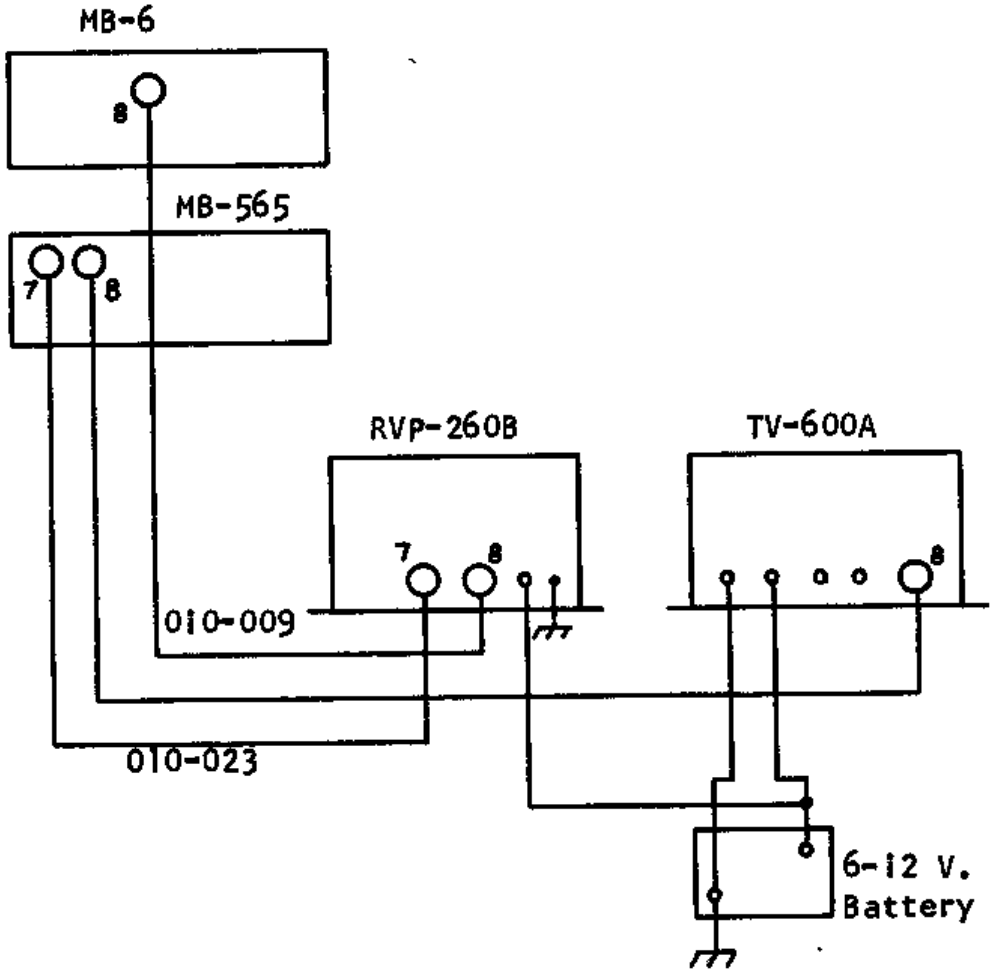
MORROW MB-6 Receiver
MORROW MB-565 Transmitter
MORROW RVP-260B Power Supply
MORROW TV-600A Power Supply

CABLES NEEDED: 6 volt

NUMBER	USED FOR:
010-009	MB-6 to RVP-260B
010-023	MB-565 to RVP-260B
010-013	MB-565 to TV-600A

CABLES NEEDED: 12 volt

NUMBER	USED FOR:
010-009	Receiver to RVP-260B
010-001	MB-565 to RVP-260B
010-012	MB-565 to TV-600A



7.1 CABLE FOR EQUIPMENT GROUP "B"

EQUIPMENT USED:

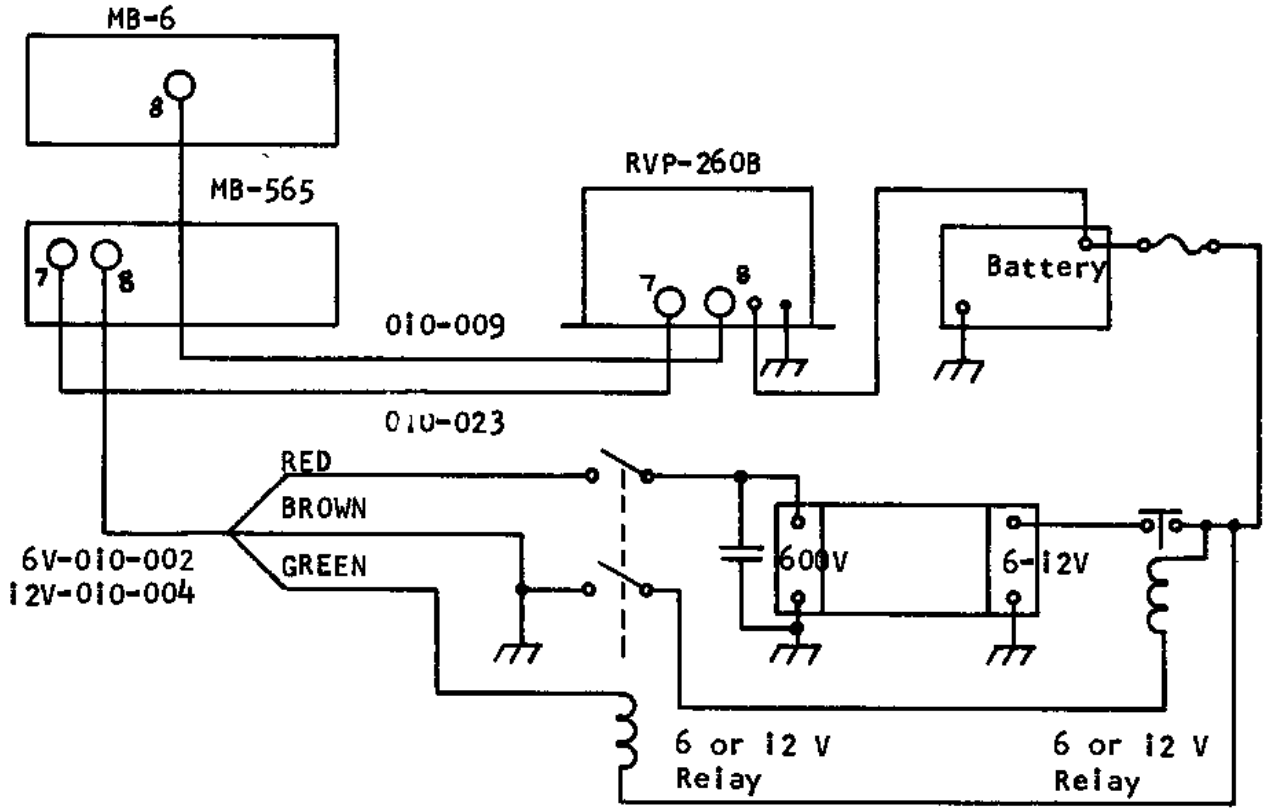
MORROW Receiver, MB-6
MORROW Power Supply, RVP-260B
MORROW Transmitter MB-565
DYNAMOTOR-400-600-volt-PEID3 ETC.

CABLES NEEDED: 6 volt

NUMBER	USED FOR:
010-009	MB-6 to RVP-260B
010-023	MB-565 to RVP-260B
010-002	MB-565 to Dynamotor

CABLES NEEDED: 12 volt

NUMBER	USED FOR:
010-009	MB-6 to RVP-260B
010-023	MB-565 to RVP-260B
010-004	MB-565 to Dynamotor



7.2 CABLES FOR EQUIPMENT GROUP "C"

EQUIPMENT USED:

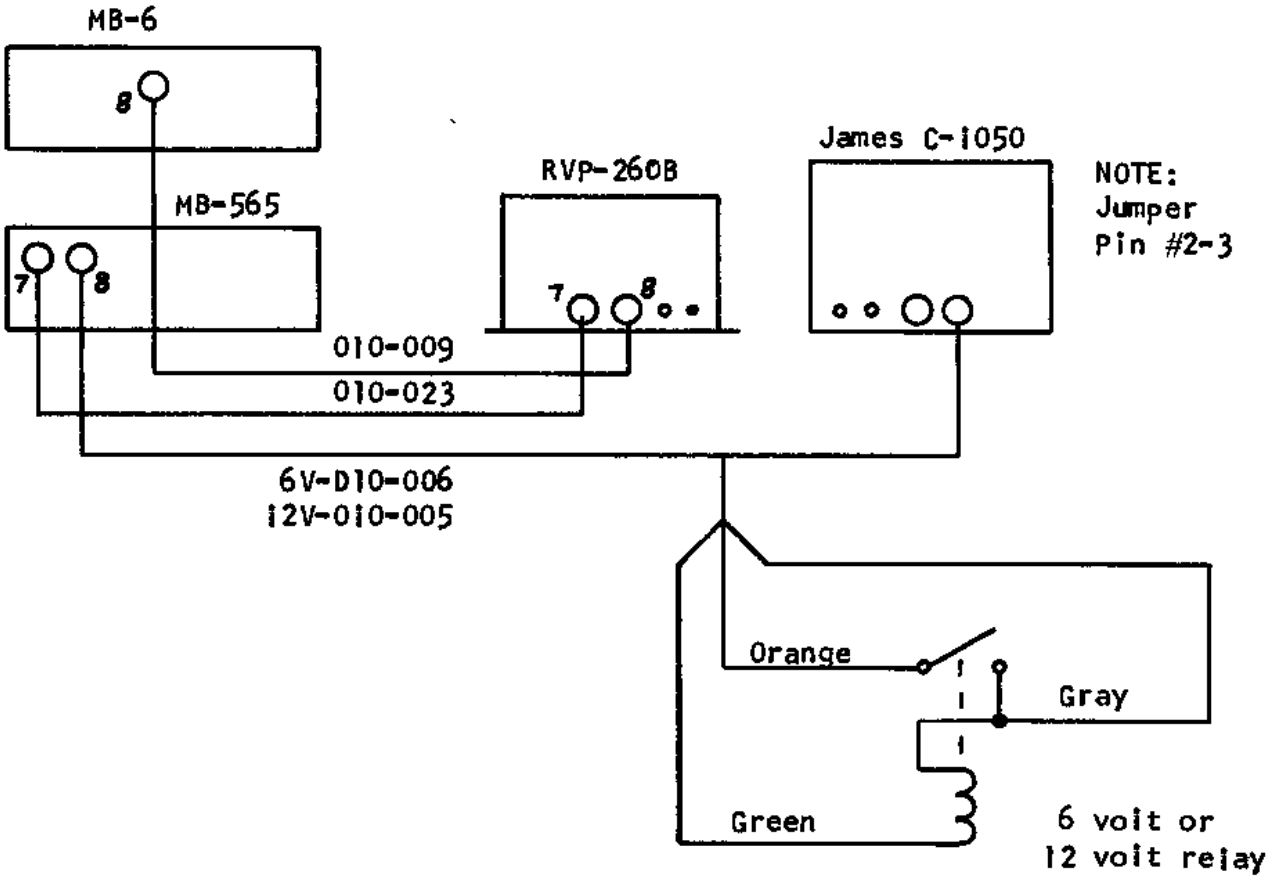
MORROW Receiver MB-6
MORROW Power Supply RVP-260B
MORROW Transmitter MB-565
JAMES Vibrator power supply #C1050

CABLES NEEDED: 6 volt

NUMBER	USED FOR
010-009	MB-6 to RVP-260B
010-023	MB-565 to RVP-260B
010-006	MB-565 to Vib. Sply C1050

CABLES NEEDED: 12 volt

NUMBER	USED FOR
010-009	MB-6 to RVP-260B
010-023	MB-565 to RVP-260B
010-005	MB-565 to Vib. Supply C1050



7.3 CABLES FOR EQUIPMENT GROUP "D"

Group D is an instaliation where the Morrow MB-565 is used with receivers of another make or where the transmitter is used as separate equipment.

EQUIPMENT USED:

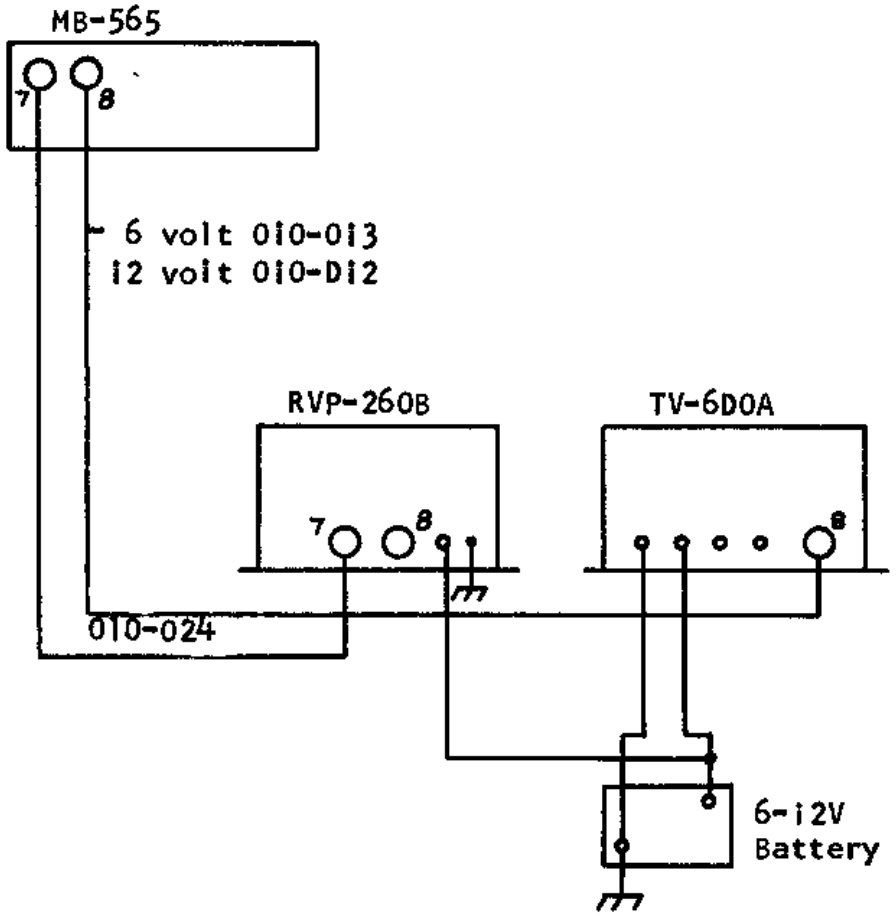
MORROW MB-565 transmitter
MORRDW RVP-260B exciter power supply
MORROW TV-600A high voltage supply

CABLES NEEDED: 6 volt

NUMBER	USED FOR
010-024	MB-565 to RVP-260B
DiD-013	MB-565 to TV-600A

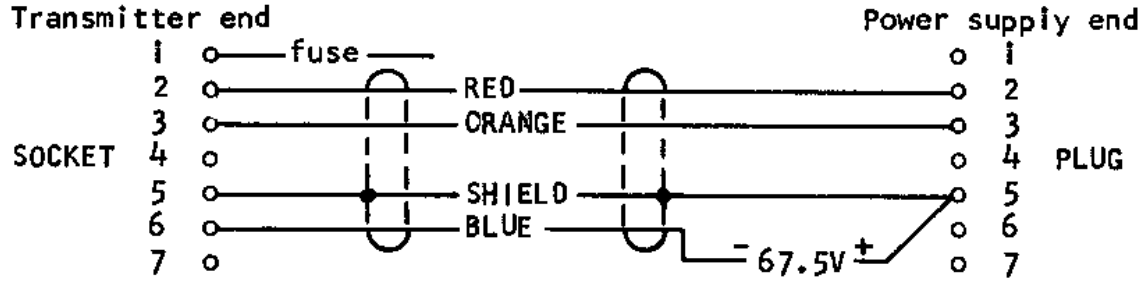
CABLES NEEDED: i2 volt

NUMBER	USED FOR
010-024	MB-565 to RVP-26DB
Di0-012	MB-565 to TV-600A



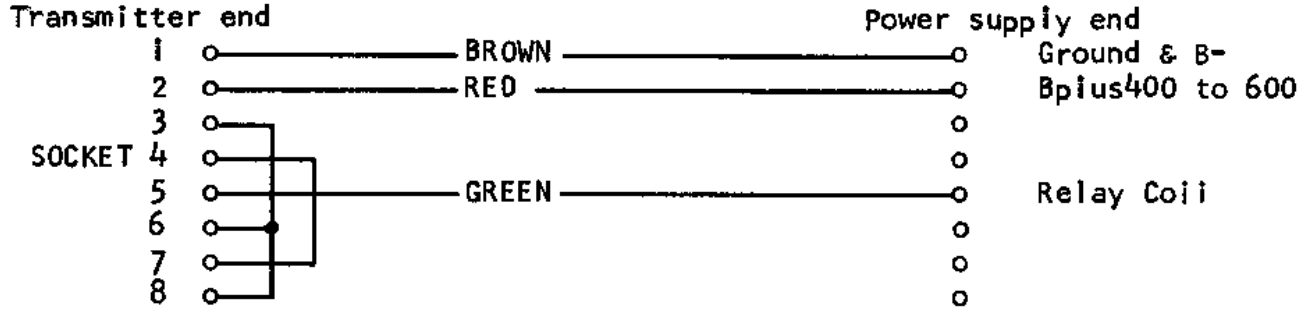
010-001

USE: MB-565 to RVP-260



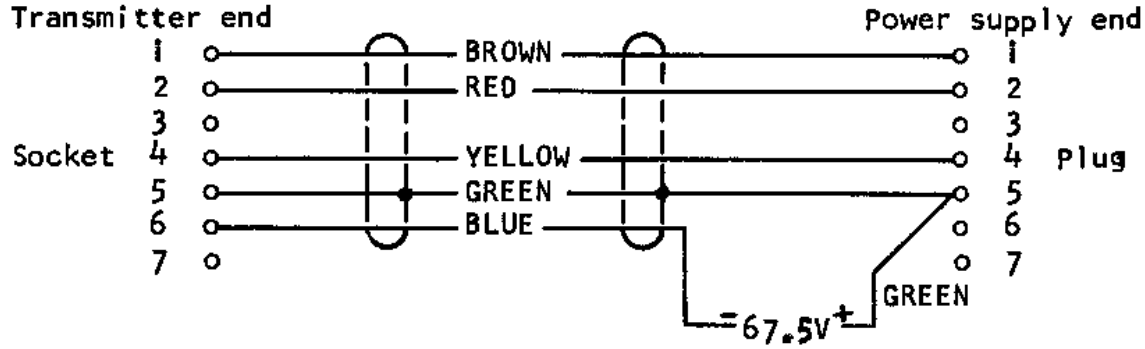
010-002

USE: MB-565 to 6 volt Dynomoter



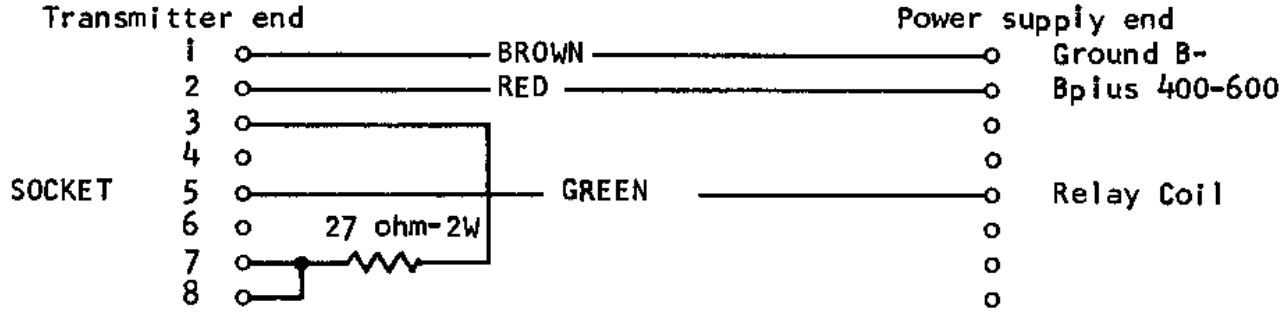
010-003

USE: MB-565 to RVP-260-with no Receiver



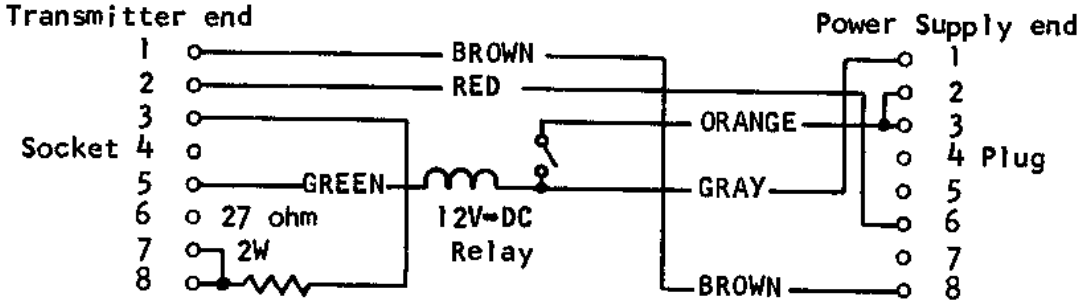
010-004

USE: MB-565 to 12 volt Dynomotor



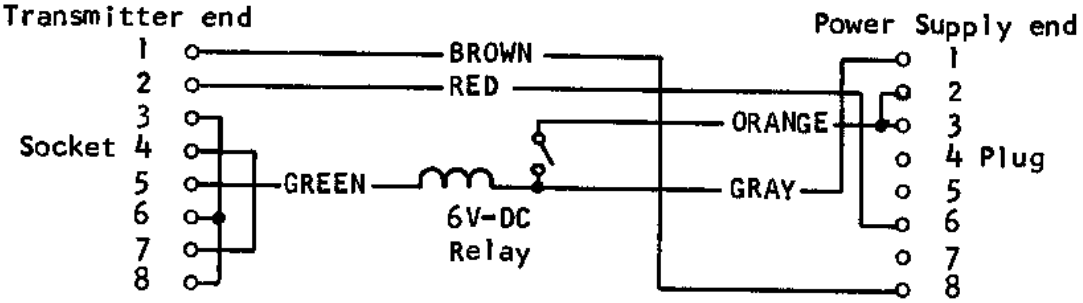
010-005

USE: MB-565 to James C1050 Power Supply-12 volt



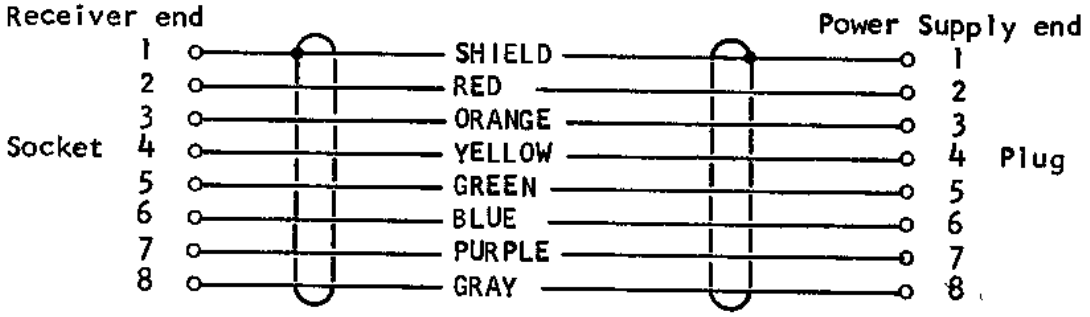
010-006

USE: MB-565 to James C1050-Power Supply 6 volt



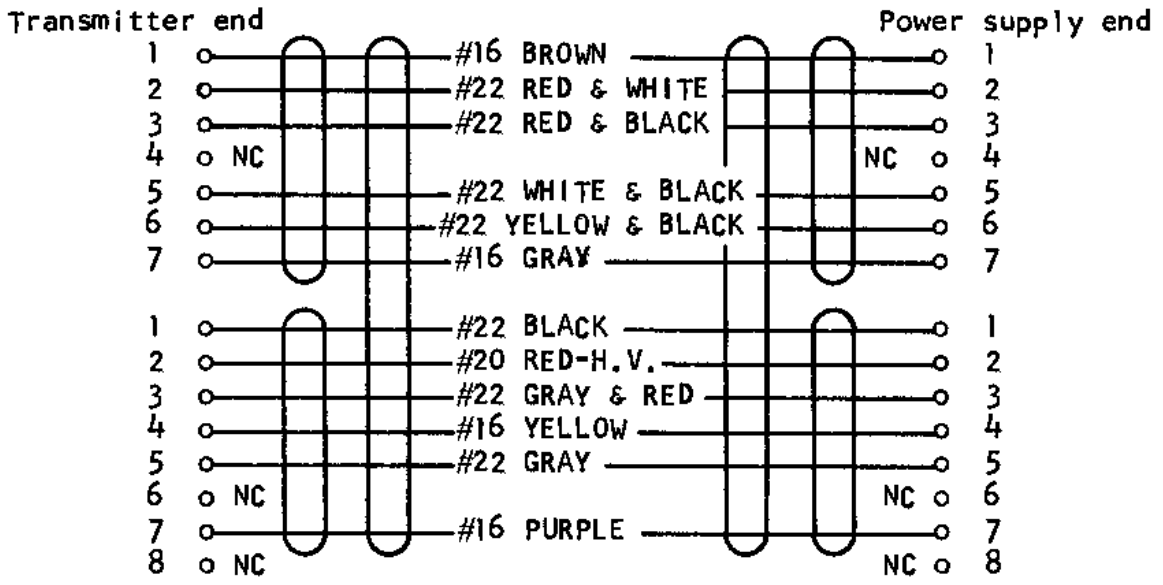
010-009

USE: MB-6 to RVP-260B



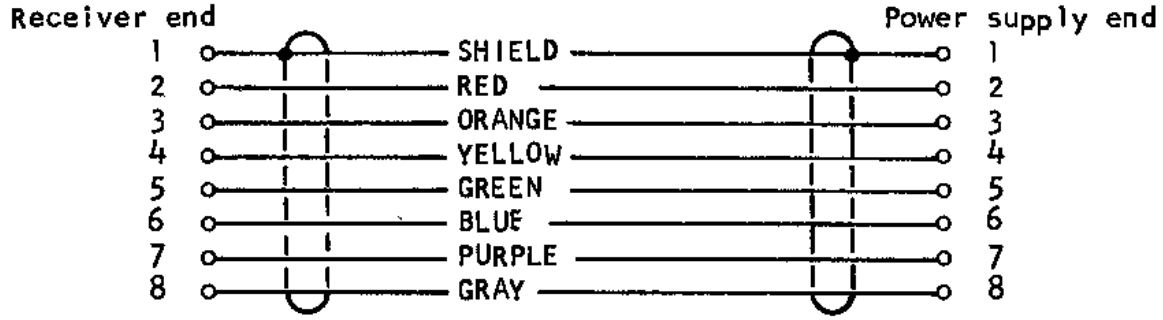
010-010

USE: MB-565 to RTS-600S



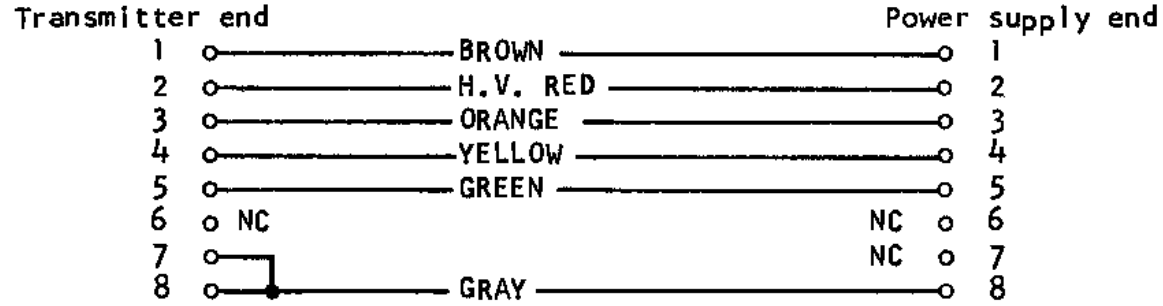
010-011

USE: MB-6 to RTS-600S

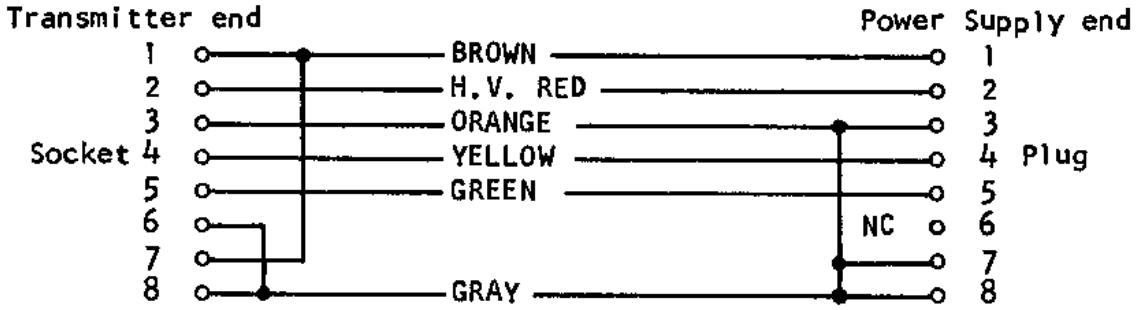


010-012

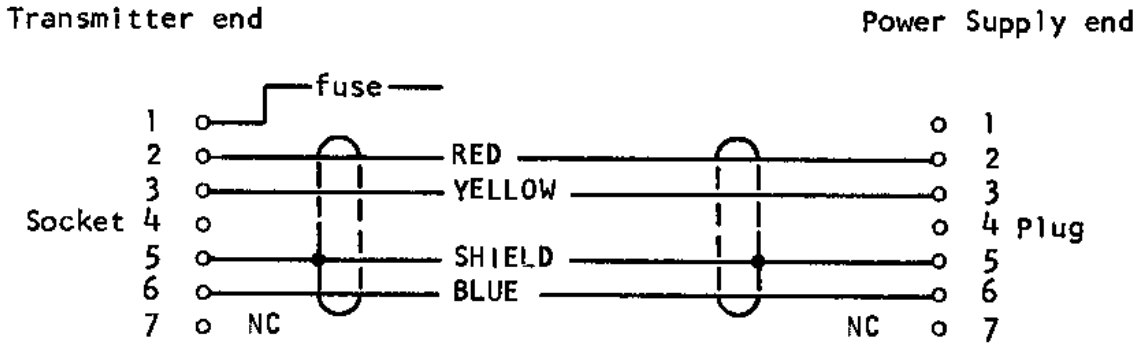
USE: MB-565 to TV-600A 12 volt



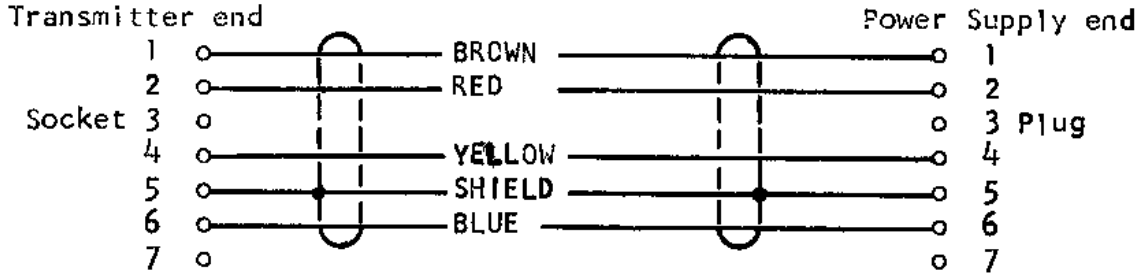
010-013 USE: MB-565 to TV-60DA 6 volt



010-D23 USE: MB-565 to RVP-260B



010-024 USE: HB-565 to RVP-260B with no Receiver



8.0 The AC power supplies
A combination AC power supply, Model RTS-600S, is available for operating the MB-565 transmitter and MB-6 receiver. This unit is complete with speaker and all relays, controls etc. It mounts either on top or behind the transmitter-receiver. A stacking frame combines the units into a complete station for desk mounting or portable work. NOTE: Jump pins 4 to 7 on J2 if the receiver is not used.

8.1 In cases where power supplies other than the special units are used, the requirements are as follows:

A. Filament power: 6 volts AC at 6 amperes, or 12 volts AC at 3 amperes.

B. Relay power: 6 volts DC at 500 ma. To obtain this voltage use an AC source of 9 volts and bridge rectify it. See diagram of RTS-600 supply. A 6 volt battery may also be used.

C. Bias voltage 67.5 volts: An AC voltage of 95 volts may be rectified with a half wave selenium rectifier and filtered with an RC filter followed by a VR 75 regulator as per the diagram for the RTS-600S supply. The additional voltage 75-67.5 is of no importance because the modulator bias adjustment will compensate for the difference. Do not use a VR90 because it will be too far out of limits. A battery may also be used in place of the supply.

D. 275 volts DC: This supply may be any supply that will give 275 volts at 100 ma.

E. High voltage supply: A 400-600 volts supply with a current capability of 200 ma may be used for the high voltage supply.

F. Both the 275 and the 600 volt supply should be switched off when the receiver is used and the transmitter is off or during stand-by periods.

G. For AC power supply connections to the transmitter, see paragraphs 4.2-4.3 and diagram of RTS-600S.

OPERATING INSTRUCTIONS

0.0 The regulations of the Federal Communications Commission, require a suitable license for the operation of this equipment. Refer to publications of the FCC or the American Radio Relay League for the latest rules governing station and operator's licensing.

0.1 Standard operating procedure for amateur radio stations is covered in the ARRL publications and should be reviewed to assure one of the best operating techniques.

1.0 CW operation: Insert key in proper jack and set CW-Phone switch in CW position. Omit steps marked with an *.

1.1 Phone operation: Place Phone-CW switch in phone position (toward outside of case). Connect microphone, and use all the following steps.

A. Set operate switch in tune position.

B. Turn wave band switch to proper band, ie, 75-40-20-15-10 meters.

C. V.F.O. Set VFO-XTAL switch in VFO position. Adjust dial to frequency, or Zero beat to received signal by turning operate switch to ZB position and adjusting the dial to zero beat with the received signal. Return operate switch to tune position.

D. Crystal control: Set V.F.O. Xtal switch in XTAL position. Insert crystal in crystal socket. Set dial to operating frequency, ie, operation desired on 29.0 MC, insert 7250 KC crystal and set dial to 29.0 MC.

E. Place meter switch in GRID position.

F. Set COURSE LOAD and FINE LOAD controls in extreme counter-clock wise position (minimum loading.)

G. Press push-to-talk switch on microphone or turn receive-transmit switch to transmit position for CW. Transmit switch see page 9, paragraphs 3.1-3.2.

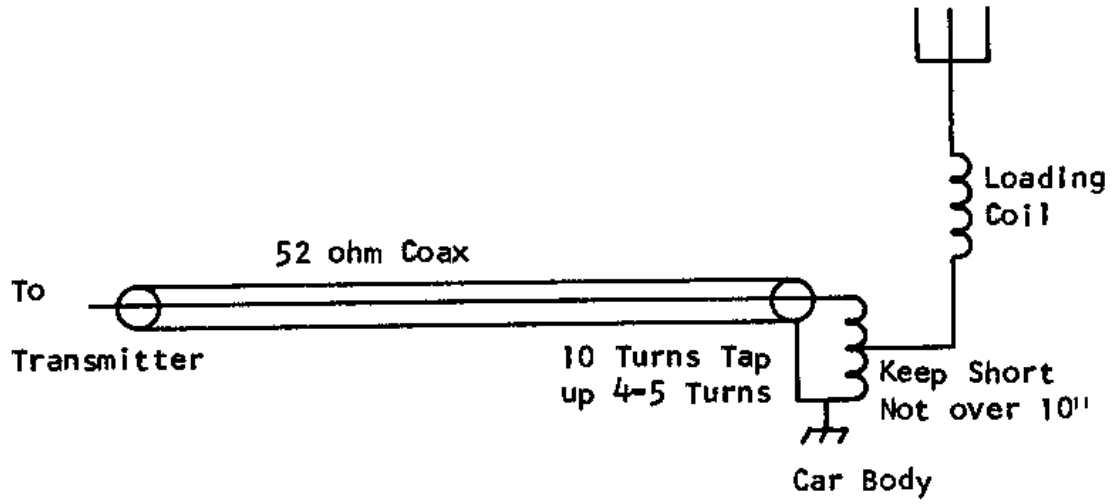
H. Adjust drive control for 2.0 MA. When using crystal control, rock dial across frequency for maximum drive.

I. Set meter in PLT position, and dip PA TUNE for minimum plate current. NOTE: on 75 meters use the dip with maximum capacity or clockwise. It is possible on 75 meter position to double to 40 with the minimum capacity setting and this should be avoided at all times.

J. Set operate switch on OPR position.

K. Turn COURSE LOAD to the right to increase antenna loading. Be sure PA TUNE is always on the dip. Increase loading until the plate current is 110-120 ma, with PA TUNE adjusted for dip or minimum current.
It will be found that one setting of the course loading control will give a reading under 110 ma and the next setting will be above 120 ma; reset the control to the lower reading and increase loading with the fine load control, to a point between 110 and 120 ma. The capacity range of the fine load control is such as to fill the gaps in the course load and acts as a vernier control. The two switches give 49 possible loading conditions.

1. TOO HIGH A MINIMUM PLATE CURRENT ON 75 METERS INDICATES the antenna is not matched to the feed line. This condition will exist only on 75 meters and will be indicated when the transmitter is tuned to the antenna frequency and the minimum loaded plate current cannot be brought down to 120 ma by adjustment of the loading controls. The correction for this condition is to match the antenna to the feed lines so the transmitter will see approximately 50-75 ohms. Under no condition should the antenna be detuned. The matching network is a coil two inches in diameter wound with 10 turns of #16 wire spaced the diameter of the wire. The coil is connected as shown in the following sketch.



L. Check PA TUNE for dip and set GRID for 2 MA.

M. Turn METER switch to MOD and with no audio input, adjust R40 modulator bias control for a meter reading of 40 MA. R40 is located on the back panel under the mike jack. This adjustment need be made only once when the transmitter is first installed and should need no further attention. In case the control will not return the plate current to 40 MA, the 67.5 volt bias battery should be replaced. The bias is obtained from a bias supply in the AC power supply for fixed station use.

N. When making adjustments on the modulator for mobile service, the operator must be inside the auto. If the operator is holding the mike and standing outside the car, he and the microphone cable become part of the antenna system and serious audio feed-back may occur.

O. The Modulation control R31 located on the back panel toward the side of the case, need be set once and should not be tampered with.

P. The only correct way to set any modulation control is to use an oscilloscope and observe the pattern. The trapezoid pattern is the better method but rather inconvenient because of the connections that need be made and for this reason we suggest the envelope method as follows:

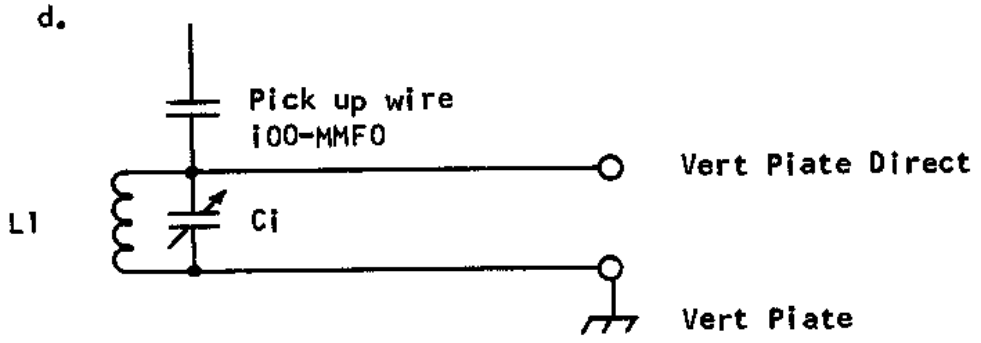
i. Any oscilloscope may be used and with the gimmick as shown in the below diagram, proceed as follows:

a. Tune C1 for maximum pattern on the tube face. The scope should be easy to observe and the pickup wire should be near to the antenna to allow enough RF to be observed on the tube face.

b. Feed a constant tone in the mike and set the control R31 for 100% modulation. We suggest you read further in the ARRL handbook for more information if needed.

c. The modulator plate current will peak up to 70-80 MA when the transmitter is fully modulated.

d.



MOBILE ANTENNAS

2.0 A mobile antenna should be considered as a quarter wave antenna that has been shortened with a loading coil, to bring its' height down to a reasonable value.

2.1 The loading coil may be at the bottom of the whip, the center or the top. The most reasonable position is either at the base or in the center. On the lower frequency bands the coil is the greater part of the antenna and its' Q or its' quality should be as high as possible. This calls for a coil of reasonable diameter and as large a wire as practical.

2.2 Several coils and whips are available and they all give reasonably good results, when they are properly tuned. It must be stated, however, that the tuning is a very important factor and if more than one frequency is to be used some method must be provided for tuning the antenna to the operating frequency.

2.3 In the early days of mobile radio, the transmitters were nearly all crystal controlled and a fixed tuned antenna was practical, however with the new 5-band variable frequency transmitters, such an antenna limits the usefulness of the transmitter to a degree which is not desirable. An antenna tuned to a frequency, 3950 KC for example, cannot be used much above 3960 or below 3940, without a great loss in radiated signal strength. An antenna with broad band characteristics in all probability is not tuned anywhere near the operating frequency and is in a sense not an antenna. An antenna that is tuned correctly will have a very sharp resonance peak and will load only on the resonant frequency.

2.4 Tuning the antenna to a spot frequency is quite a problem because it is critical to within ¼ turn. A much more practical antenna tuning system is to use a roller coil at the base of the antenna. The roller coil may be adjusted manually which is not very satisfactory when you are driving down the highway and changing frequency, or by the use of an electric motor controlled from the operating position.

2.5 The MORROW MLV-50 antenna tuner, is a roller coil, electrically actuated by a motor, controlled from the operating position. The MLV-50 incorporates a line to antenna impedance matching network allowing the pi network to work into its' characteristic impedance.

2.6 The MLV-50 has its' greatest value on 75 and 40 meters. It may also be used on 20-15 and 10 meters, however on 15-10 meters we recommend the antenna feed line connect directly to the base of the antenna. With a loading coil on the antenna, cut for 4000 KC, the MLV-50 will tune the antenna from 4000 KC down to 3750 KC. The 75 meter coil may be shorted and the MLV-50 will base load the antenna for 40 and 20 operation. On 40 meters better results will be had if the loading coil is cut for 7300 KC and the tuner is used for its' prime purpose ie, to tune the antenna from 7600

down to 7000 KC. On 20 meters, the MLV-50 can be used as a base load with results about equal to a center loaded antenna, with tuner.

2.7 The matching network on the MLV-50 is set for 75 meter operation because this is the frequency where the greatest mis-match occurs. A 75 meter antenna has an impedance below 15 ohms offering a loss when it is fed with a 50 ohm line. If the matching network is not used, the feed line becomes part of the antenna, a very undesirable condition.

2.8 To adjust the loading coil on the antenna with a MLV-50 installed, we will use as an example, the 75 meter band. Connect the MLV-50 to the antenna and connect the coax feed line. Couple the transmitter end of the feed line to a grid dip meter by a 4-5 turn link, temporarily fastened to the end of the line. With the roller coil set for minimum inductance, roller on the end of the coil away from the motor, check antenna frequency by noticing the dip on the grid dip meter. Remove turns from the loading coil until the frequency is just above 4000 KC. Be sure the trunk lid is closed and the antenna is free of trees or other objects. Many turns will need to be removed. When the antenna is adjusted, connect the feed line to the transmitter.

2.9 Loading the transmitter. In every case the loading of the transmitter is a function of the antenna tuning. For example, 3900 KC. Set the transmitter to 3900 KC. Have the course and fine load controls to the left or counter clockwise. Dip the final for minimum plate current. Turn on the MLV-50 motor and watch the plate current. When the antenna comes into resonance, the plate current will increase. Keep the final dipped at all times. After the motor turns the MLV-50 through resonance, the current will drop. Back the motor up for a peak current reading with the final dipped. Increase coupling for a plate current of 110-120 ma with the final dipped.

If a MORROW MB-6 receiver is used the indicator should be the FIELD STRENGTH METER. Always tune the antenna and the transmitter for maximum field strength reading.

FIXED STATION ANTENNAS

3.0 A pi network is designed to work into a low impedance such as 50 or 75 ohm coax. An antenna which has a characteristic impedance of 50 to 75 ohms is preferable for the MB-565 such as a dipole, ground plane or coax-fed beam. On 10-15 or 20 meters, the beam type is recommended due to its' high gain and directional characteristics on 40 and 75 meters, a dipole or ground plane is most satisfactory. All band antennas are generally a compromise in antenna design and are subject to harmonic radiation as well as the desired signal. Ideally, single band antennas are recommended.

3.1 When balanced feed lines are used such as 300 ohm twin lead, some matching device is necessary to couple into the pi network. Balun coils which are available commercially (or instructions for winding them can be found in the ARRL handbook) will match the unbalanced output of a pi network to a balanced feed line quite satisfactorily. If a balanced feed line is used without some matching device, a standing wave ratio and impedance mis-match will be so great that most of the signal will be dissipated in the form of ineffectual energy.

3.2 In all cases an adequate ground must be used. Four to eight feet of copper rod can be driven into the ground and a number 10 or heavier copper ground wire attached and run to the chassis of the MB-565. This will generally be adequate, providing the ground wire is not too long. If there is any evidence of RF on the transmitter cabinet such as manifested by touching the knobs on the cabinet and feeling a bite or by lighting a small neon bulb when touching the cabinet when the transmitter is turned on, it is an indication of an inadequate ground or a mis-match to the antenna system or both.

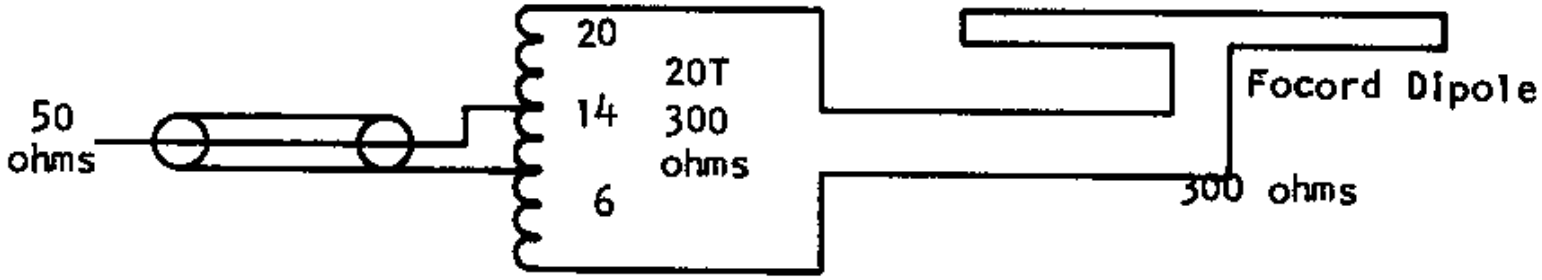
3.3 Under no circumstance should the transmitter be connected to a random length of wire, or any antenna with an impedance of other than 50-70 ohms. The pi network in the transmitter is designed to couple a 3000 ohm tube to a 50-70 ohm load. The coil in the final tank L23 is designed for this matching condition, and is fixed for each band.

3.4 Just because a transmitter has a pi network in it does not mean it will load into anything. In fact, just the opposite is true, unless the network is designed for this condition. To say the least, a network that will load into any impedance is complicated to construct and still worse, it is complicated to set up for operating. The reason is that for every frequency and every impedance, different values of the input and output capacitors are required and also different values of inductance are needed. it can be seen, thousands of differant values would be needed, however, only one value of each capacitor and the inductor would work for any one frequency and load impedence. Such a device would be impractial to say the least. It is true, hundreds of differant combinations would load the tube to the required plate current, but, only one combination would put any power into the antenna with any efficiency.

3.5 Several different networks, such as a L or pi, will match a 50 ohm source to any chosen load, however, a very simple unit that will do the job is an autotransformer.

3.6 An example: An autotransformer to go from a 50 ohm to a 12 ohm is shown in paragraph K-1. In auto transformer design the turns ratio is equal to the square of the impedance ratio. In the K-1 example the turns ratio is 2 to 1 so the impedance ratio is 4 to 1, or 50/4 equals 12.5 ohms. If the tap was down to 3 1/3 turns, the turns ratio would be 3 to 1 and the impedance ratio would be 9 to 1 or 50/9 equals 5.5 ohms. If the tap was down 2 turns, the turns ratio would be 10/8 or 1.25 to one and the impedance ratio would be 1.25 squared or 1.56 or

6.7 If the transformer wants to step the impedence up we would use the example below. The exemple will go from 50 ohm to 300 ohms.



The total turns could be 20. The impedence ratio is 300/50 or 6. The turns ratio would be the square root of 6 or 2.45. 20/2.45 equals 8.1. In this case the coax would connect across 8 turns and the 300 ohm feeder would connect across to the outside ends of the coil or 20 turns.

6.9 In any practical work the results will very slightly from the calculated values, however, these variables will not be very great and if they are, you should double check your work. Reference of networks can be found in the 1957 ARRL handbook pages 150 thru 154. Reference for transmission line pages 318 thru 342: and antenna 325 thru 373. We prefer our mobile antenna matching to that shown in figure 19-46, page 475, and we strongly suggest you use the auto transformer method.

MB-565 PARTS LIST

RESISTORS: All values in ohms and ½ watt unless otherwise specified.
K equals 1000 ohms. M equals 1,000,000 ohms.

R1	47K	R24	5.6K
R2	47K	R25	10 M
R3	470	R26	180
R4	10K 1W	R27	470
R5	100K	R28	56K 1W
R6	180	R29	220K
R7	47K	R30	22K
R8	1 K	R31	500K Pot.
R9	22K	R32	470K
R10	22K	R33	2.2K
R11	4.7 1W	R34	220K
R12	100 1W	R35	220K
R13	100K 1W	R36	220K
R14	4.7 1W	R37	10K
R15	22	R38	220K
R16	4.7K 1W	R39	4.7 1W
R17	15K 2W	R40	20K Pot.
R18	18K 2W	R41	750 10W
R19	18K 2W	R42	100K
R20	4.7K 1W	R43	47 & 22 Parallel.
R21	2K Reo.		
R22	47K		
R23	100K Pot.		

CAPACITORS: All values in micromicro farads unless otherwise specified.
SM equals Silver Mica.

Temperature Compensator Groups:

TC1	7.5 N 1400 parallel with 22 N 750 & 15 N 750 in series	
	281-114	281-307 281-110
TC2	56 N 220 parallel with 50 N330	
	281-311	281-107
TC3	83 N330, 33, N330, & 56 N220 in parallel	
	281-113 281-103	281-311
TC4	110 N470 parallel with 75 Silver Mica	
	281-101	281-402
TC5	50 N470	
	281-109	

C1	4.5-25 NPO Cer. Trim.
C2	4.5-25 NPO Cer. Trim.
C3	4.5-25 NPO Cer. Trim.
C4	4.5-25 NPO Cer. Trim.
C5	4.5-25 NPO Cer. Trim.
C6A	500 SM 300V
C6B	500 SM 300V
C6C	500 SM 300V
C6D	400 SM 300V
C6E	250 SM 500V
C7A	500 SM 300V
C7B	500 SM 300V
C7C	400 SM 300V
C7E	250 SM 500V
C8	100 SM 500V
C9	10 SM 500V
C10	.01 MFD Disc. 500V.
C11	25 GP 500V
C12	50 N330 Disc.
C13	.01 MFD Disc. 500V
C14	6 NPO Disc. 2 KV
C15	.01 MFD Disc. 500V
C16	50 N330 Disc.
C17	50 N330 Disc.
C18	50 N330 Disc.
C19	33 N470 Oisc.
C20	.01 MFD Disc. 500V
C21	50 N330 Disc.
C22	.01 MFD Disc. 500V
C23	.01 MFD Disc. 500V
C24	.01 MFD Disc. 500V
C25	.002 MFD Oisc. 500V
C26	2000 SM 500V
C27	2000 SM 500V
C28	265-880 Mica Trimmer ARCO 306M
C29	265-880 Mica Trimmer ARCO 306M
C30	265-880 Mica Trimmer ARCO 306M
C31	50 N330 Disc.
C32	33 N330 Disc.
C33	6 NPO Disc. 2KV
C34	.01 MFD Disc. 500V
C35	.01 MFD Disc. 500V
C36	.01 MFD Disc. 500V
C37	.01 MFD Disc. 500V
C38	.002 MFD Disc. 500V
C39	.005 MFO Disc. 1.5 KV
C40	.001 MFO Disc. 2 KV
C41	250 SM 500V
C42	250 SM 500V
C43	250 SM 500V
C44	250 SM 500V
C45	250 SM 500V
C46	250 SM 500V
C47	50 SM 500V
C48	50 SM 500V
C49	50 SM 500V
C50	50 SM 500V
C51	50 SM 500V
C52	50 SM 500V
C53	.001 MFD Disc. 500V
C54	100 GP 500V
C55	100 GP 500V
C56	15 MFD Electro 25V
C57	.1 MFD Paper 400V
C58	.01 MFD Oisc. 500V
C59	15 MFD Electro 25V
C60	.01 MFD Disc. 500V
C61	.01 MFD Disc. 500V
C62	.01 MFD Disc. 500V
C63	.1 MFD Paper 200V
C64	.1 MFD Paper 400V
C65	25 GP 500V
C66	.01 MFD Disc. 5D0V

INDUCTORS:

L1	75 meter osc coil	Part #	108-099
L2	40 meter osc coil		108-100
L3	20 meter osc coil		108-101
L4	15 meter osc coil		108-102
L5	10 meter osc coil		108-103
L6	460 uh RF choke		108-501
L7	460 uh RF choke		108-501
L8	460 uh RF choke		108-501
L9	460 uh RF choke		108-501
L10	2.5 mh RF choke		108-502
L11	460 uh RF choke		108-501
L12	40 meter amp coil		108-098
L13	20 meter amp coil		108-104
L14	15 meter amp coil		108-105
L15	10 meter amp coil		108-106
L16	75 meter drive coil		108-034
L17	40 meter drive coil		108-035
L18	20 meter drive coil		108-037
L19	15 meter drive coil		108-038
L20	10 meter drive coil		108-039
L21	Parasitic choke		108-041
L22	2.5 mh RF choke		108-512
L23	5 band tank coil		108-040

MISCELLANEOUS PARTS:

CV1-2-3	VFO tuning condenser	283-301
CV-4-5	PA tuning condenser	283-302
CV	Oscillator trimmer	281-811
T1	Modulation transformer	120-104
M	0-1 MA F.S., 0-5, 0-200 Scales	149-008
N1	Western Electric N1 unit	439-001
SM1	Push-to-talk switch	260-023
P1	Microphone plug #91 MC4M	134-019
J1	Microphone socket #91 PC4F	134-017
J2	Key Jack	134-043
J3	Crystal socket .486-.093	136-011
J4	Receiver Antenna Socket	136-012
J5	Antenna socket #83-1R	134-024

J6	Power plug 8 pin	134-013
	Matching unit #78-PF8-11	136-022
	plug/socket cap	134-031
J7	Power plug 7 pin	134-012
	Matching unit #78-PF7S-11	136-023
	plug/socket cap	134-031
RY	Relay DPDT 6VDC 26 ohm	148-011
S1	Shorting Wafer 5 pos.	260-014
S2A,B	Shorting wafer 5 pos.	260-014
S3	2P5P wafer	260-013
S4	Shorting wafer 5 pos.	260-014
S5A,B	Shorting wafer	260-013
S6	Shorting wafer 5 pos.	260-014
S7	Ceramic wafer	260-029
S8	Ceramic wafer	260-029
S9	Course load switch	260-027
S10	Fine load switch	260-027
S11	VFO Xtal switch	260-026
S12	Meter Switch	260-030
S13	Phone CW switch	260-016
S14	Operate switch	260-028
Dial Glass		351-020
Dial Scale		331-007
Band Switch Knob		437-501
Tuning Knob		437-501
Control Knob		437-502
Small Knob		437-503
Knob Shaft and Gear		213-511
Pinion Gear		380-002
Large Drive Gear		380-001
Wave Band switch shaft S1-S6		260-033
Wave band switch shaft S7-S8		260-021
Wave Band switch arm		351-010
Wave band switch tie rod		384-503

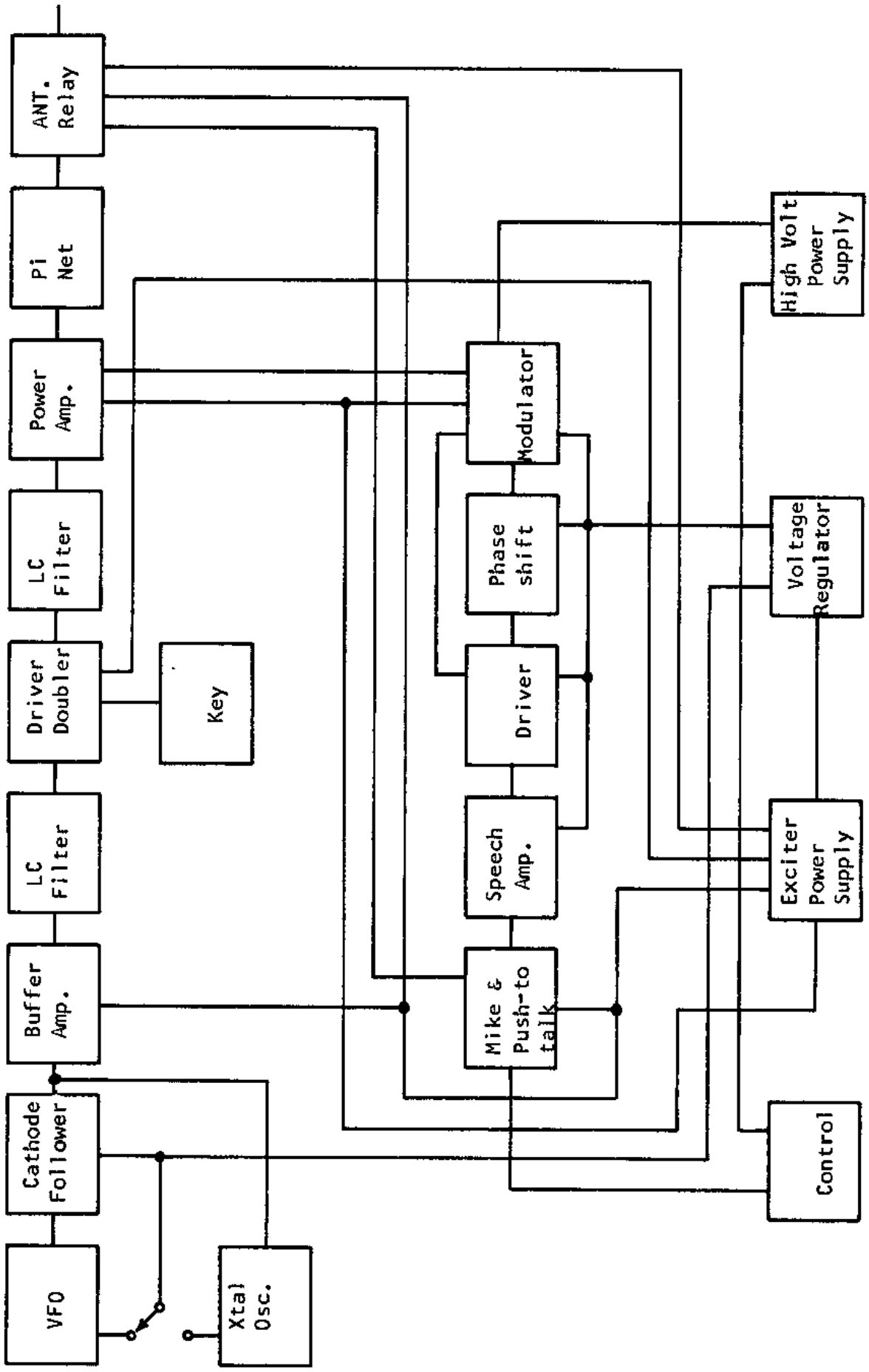
MB-565 VOLTAGE CHART

Wave band switch on 75 and dial set at 3.9 MC
RMS* R.F. Measured with Hewlett-Packard VTVM 410-B
*VTVM-DC

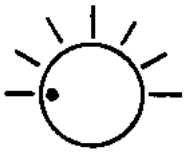
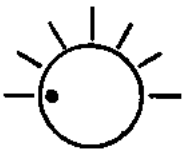
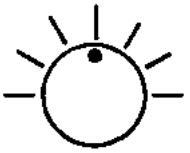
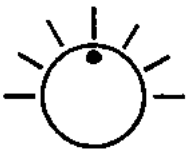
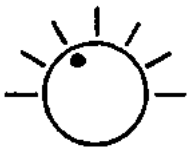
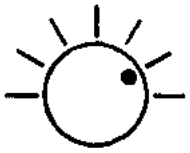
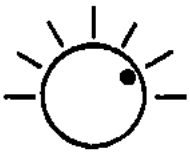
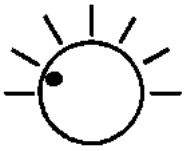
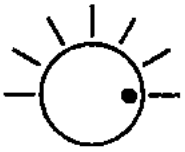
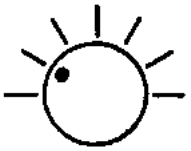
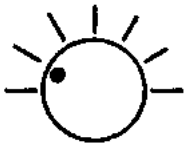
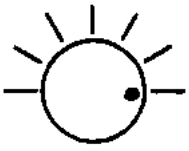
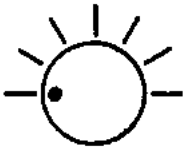
1. Power Supply-AC-115V
2. S-14-In OPR position
3. S-11-In VFO position
4. S-11-In XTAL position
5. S2A-In 75 meter position
6. S12-In grid position
7. 6146 Loaded to 120 MA into dummy 52 ohm load
8. S-13 Phone position
9. Modulator JP-40MA
10. No-audio input
11. Mike connected (N-1)
12. Push-to-talk switch on.

TUBE	1	2	3	4	5	6	7	8	9
OSC 12AT7	218	RMS 13V	RMS 8V	AC 5.6V					
Buffer 6AN8	218V	RMS 7½V	13V	0	AC 5.6V	262V	165V	RMS 4½V	1.8V
Doubler 5763	262V	262V	0	0	AC 5.6V	32V	0	-5 RMS 10V	NC
Final 6146	00	AC 5.6V	175V	0	60VRMS -75DCV	0	0	0	
Top of R-20	540V								
1st AF 6AV6	* NR	0	AC 11.2	AC 5.6V	0	0	95U	* 1.9V	AC 11.2V
Driver 12AT7	110V	NR	2.2V	AC 5.6V	AC 5.6V	105V	NR	* 2.2V	AC 11.2V
Modulator 6AV5	* -52V	AC 11.2V	0	NC	DC 550V	NC	AC 5.6	218V	
Modulator 6AV5	* -52V	AC 11.2V	0	NC	DC 550V	NC	AC 5.6	218V	
V-R Back OB2	218V	108V	NC	108V	NC	NC	NC		
V-R Front OB2	108V	0	NC	NC	NC	NC	NC		
J1	* .2V	* .2V	0	0					
J6	0	DC 560V	DC 8.5V	0	0	AC 5.6V	AC 11.2V		
J7		DC 262V	0	0	0	DC -75			
J5	RMS across Antenna 44 Volts								

TRANSMITTER BLOCK DIAGRAM

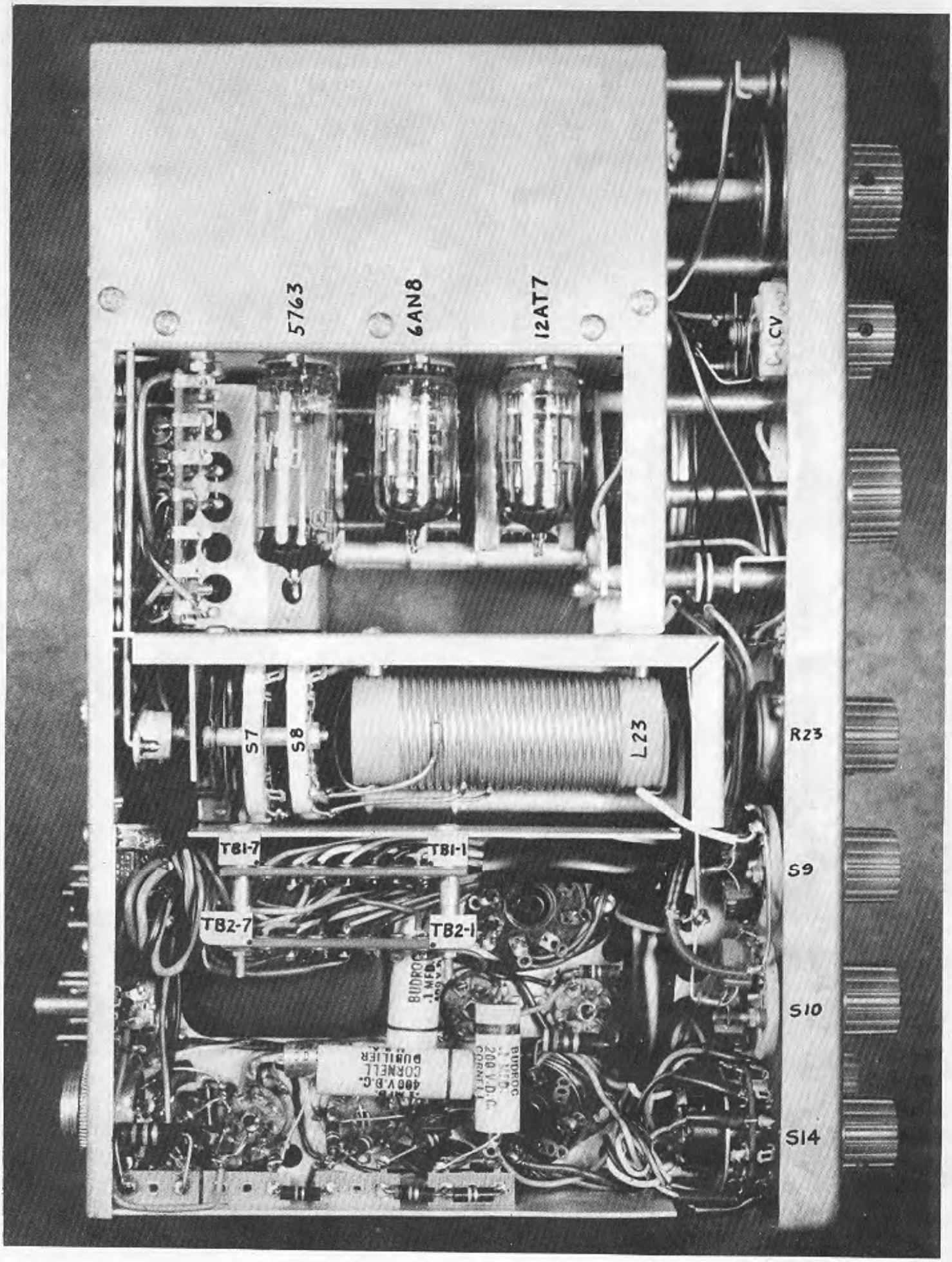


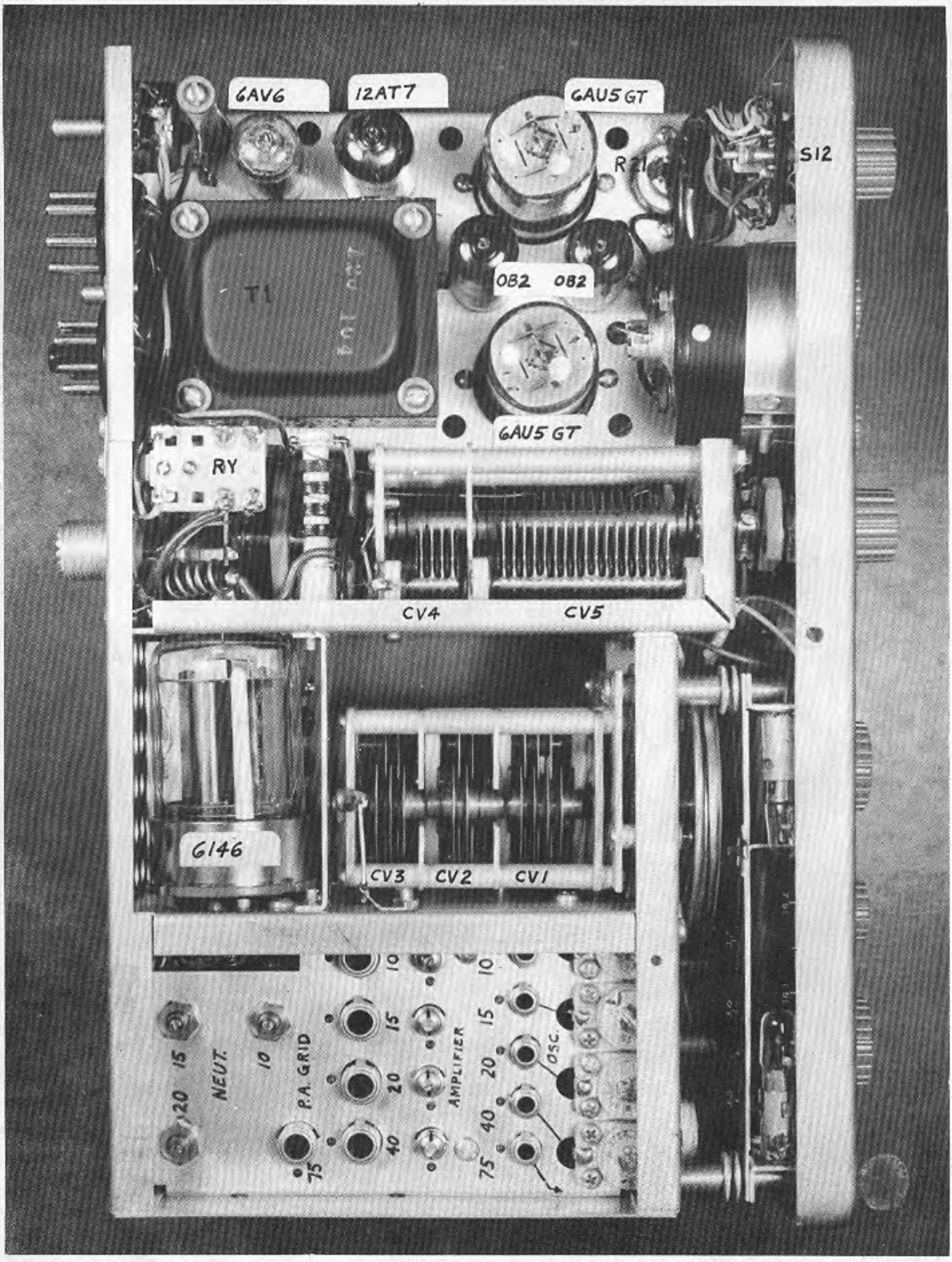
TRANSMITTER LOADING CONTROL POSITIONS

BAND	PA-TUNE	COARSE LOAD	FINE LOAD
75			
40			
20			
15			
10			

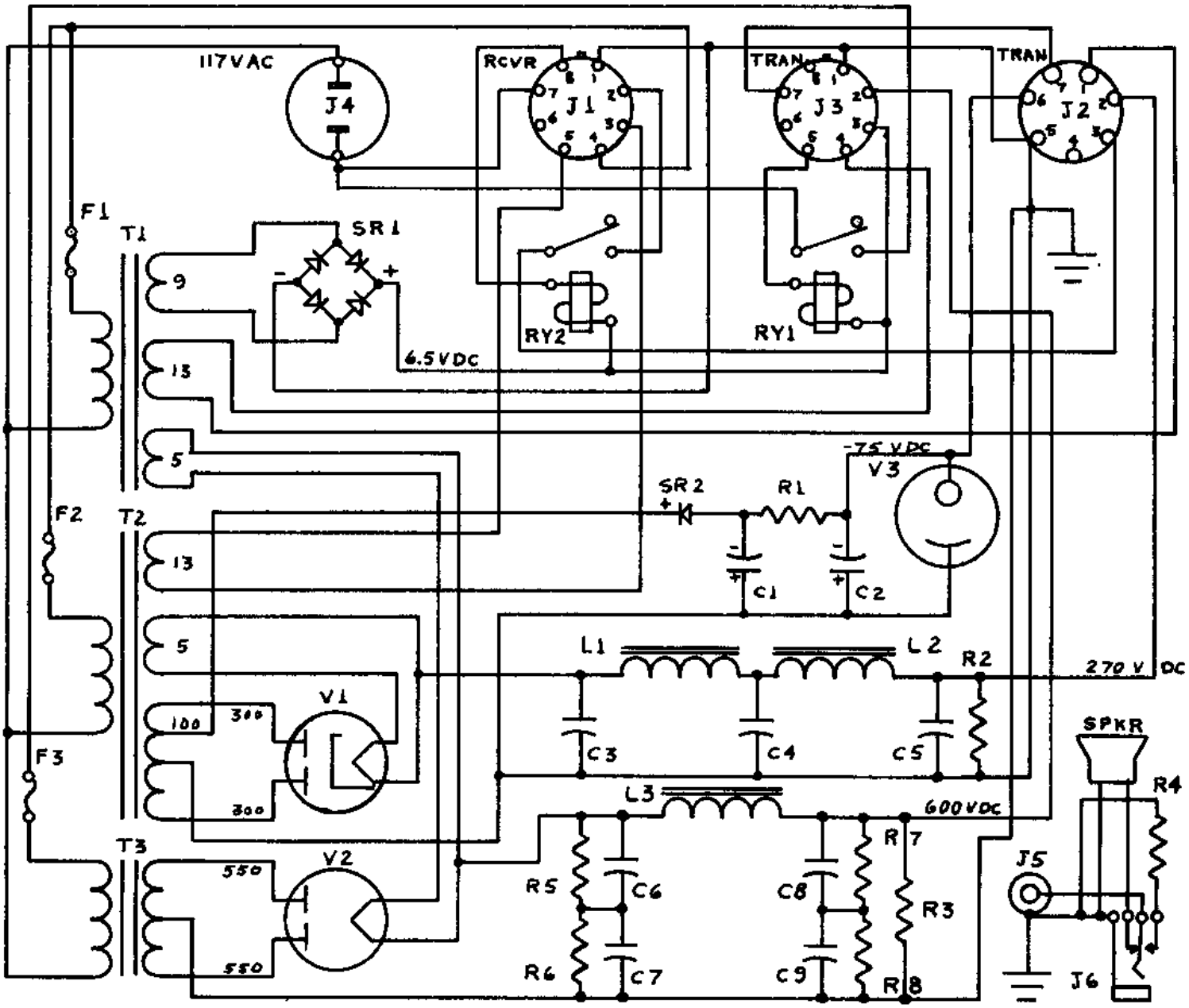
Approximate loading positions providing antenna is resonant and fed with 52 to 72 ohm feed line. The COARSE LOAD should <u>not</u> vary over one notch in which case the FINE LOAD would be near the opposite end of its' range. It has been found that these settings will prevail on resonant antennas such as, whips, verticals, dipoles and beams, fed with either 52 or 72 ohm feed line.

These positions are valid <u>only</u> if the feed line is matched to the antenna.


5763
6AN8
12AT7
CV
L23
S7
S8
R23
S9
S10
S14
TB1-7
TB1-1
TB2-7
TB2-1
BUDDOG
400 V.D.C.
CORNELL
DUBILIER
BUDDOG
200 V.D.C.

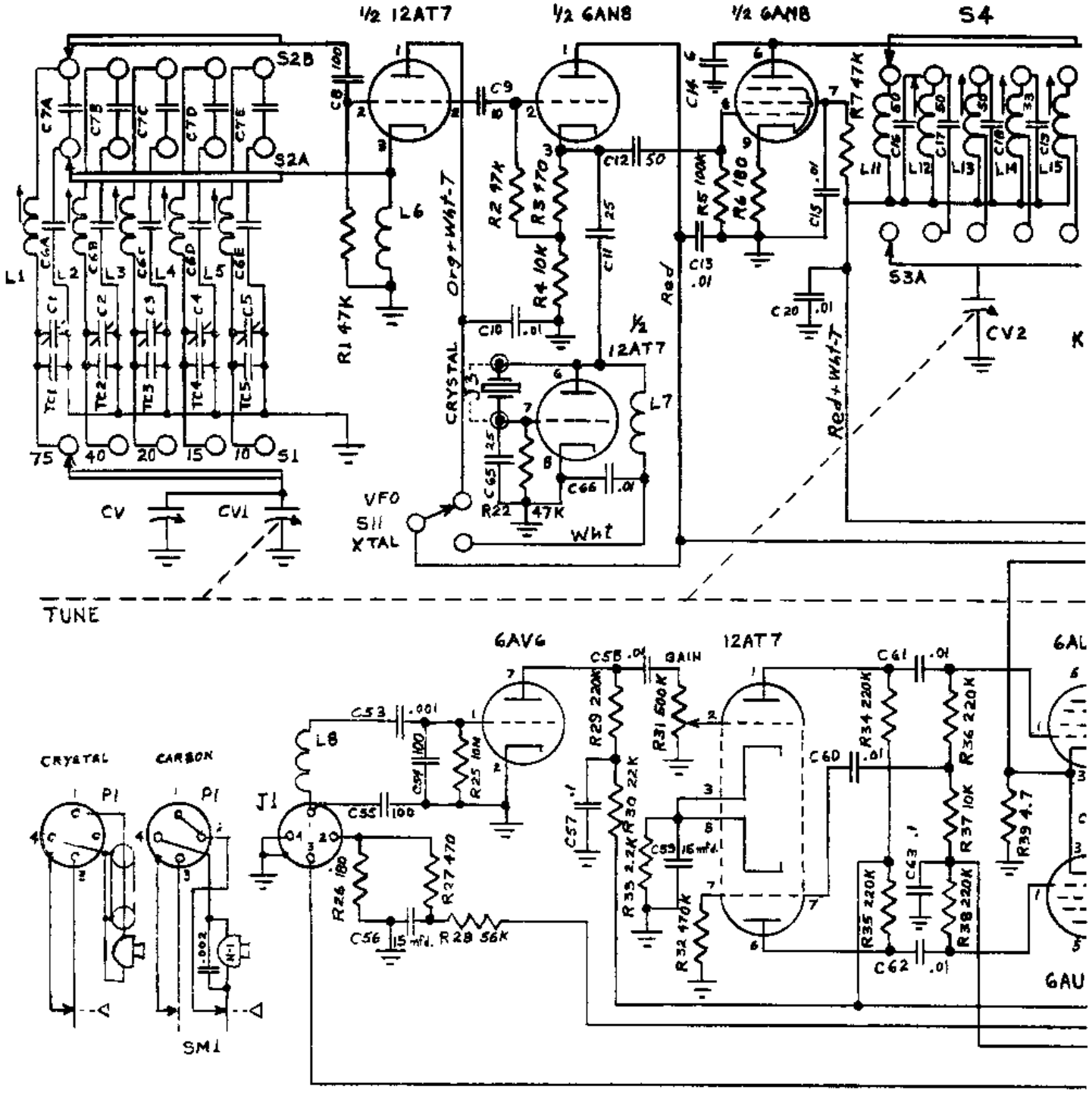

6AV6
12AT7
6AU5 GT
S12
R21
T1
0B2 0B2
6AU5 GT
RY
CV4
CV5
6146
CV3 CV2 CV1
NEUT.
P.A. GRID
AMPLIFIER
OSC.
10
15
20
40
75

RTS-600S POWER SUPPLY
MORROW Radio Mfg. Co., Salem, Oregon



PARTS LIST

C1, 2 20 mfd 150v Electro.
C3, 4, 5 16 mfd 450v Electro.
C6, 7, B, 9 20 mfd 450v Electro.
F1, 2, 3 Fuse, AGC 2
J1, 3 Octal socket, MIP-B
J2 7-pin socket, MIP-7
J4 AC line plug
J5 Speaker Jack
J6 Headphone Jack
L1, 2.9H. 90 MA 250 ohm
L3 7H. 200 MA 65 ohm
R1 1.5K 1W
R2 25K 10W
R3 25K 20W
R4 4.7 ohms 1W
R5, 6, 7, B 470K 1/2W
RY1, 2 SPST 6VDC
SPKR 5"x7" PM 3-4 ohms
SR1 Sel. Bridge Sarkes 604B
SR2 Sel. Rect. Sarkes Model 65
T1 Transf. Morrow PF7
T2 Transf. Morrow PF6
T3 Transf. Morrow PF5
V1 5Z4
V2 5R4GY
V3 OA3/VR75



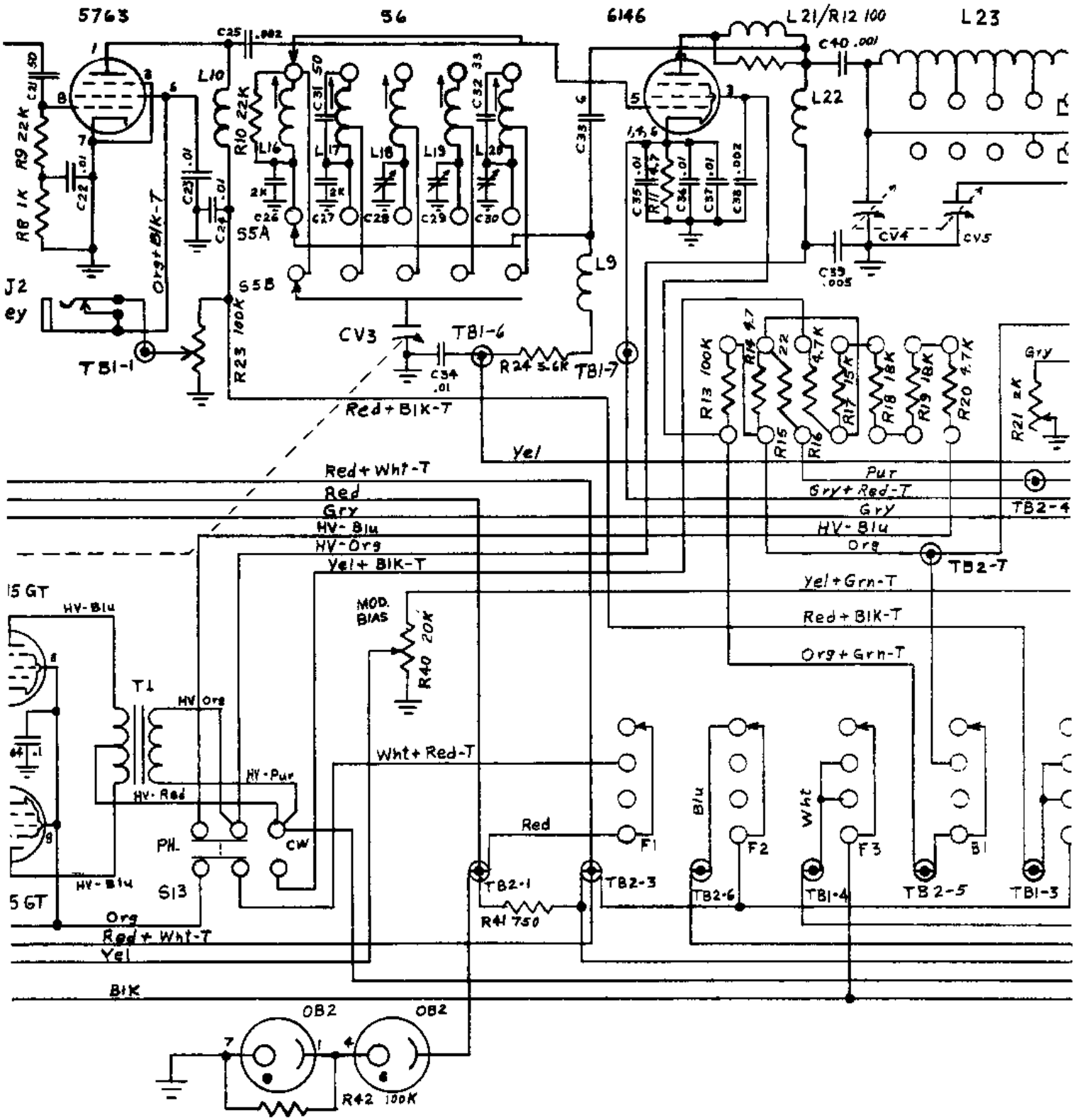
J6 CONNECTIONS:

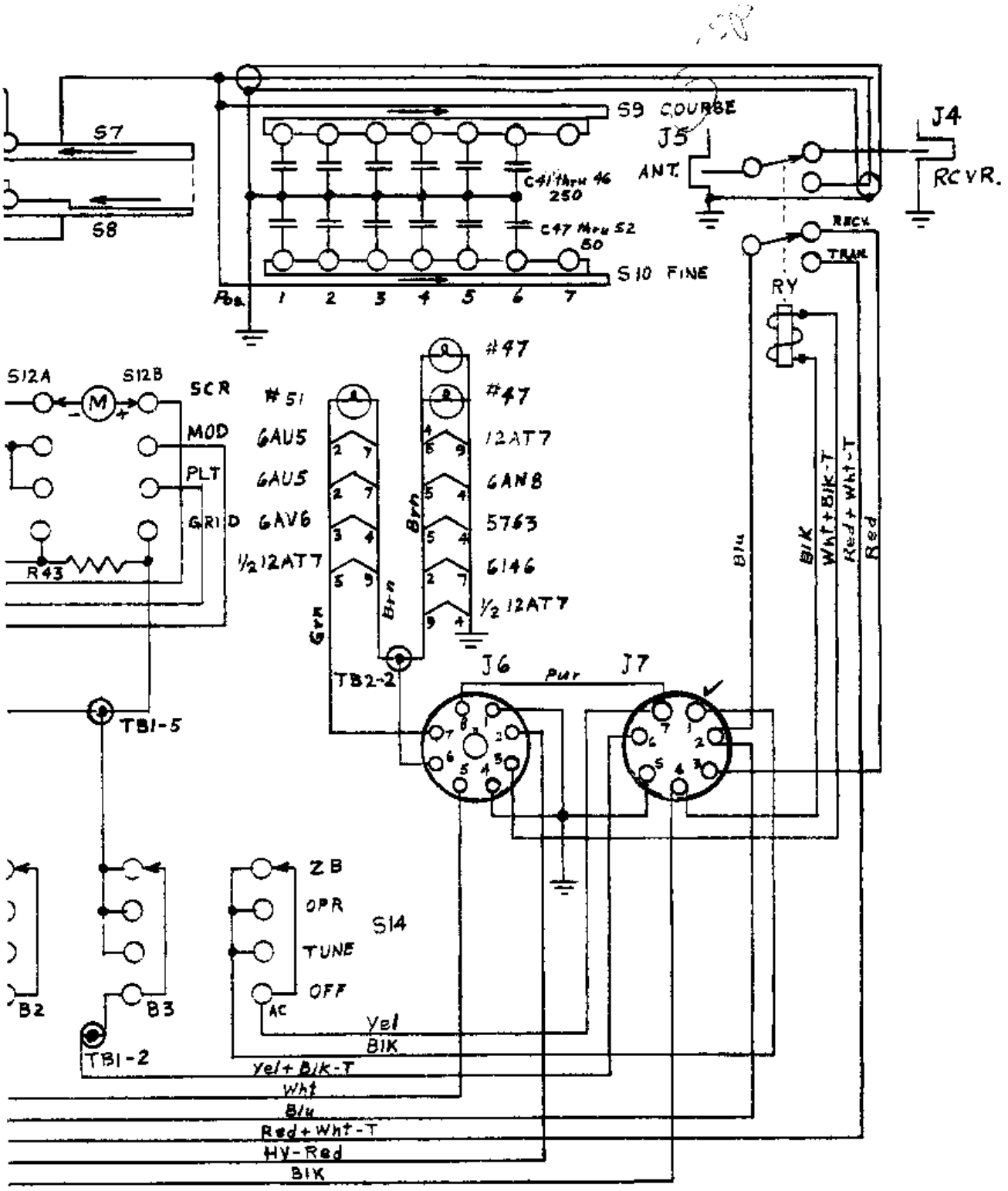
1. Ground
2. B plus High Voltage input
3. Ry Coil Supply (6 V DC)
4. Ground
5. Control of HV Relay
6. Htr. C.T. (6 V Conn.)
7. Htr. (12 V Conn.)
8. OFF-ON Switch Output

J7 CONNECTIONS:

1. OFF-ON SW. Input (Bat.)
2. B plus 275 V EXC input
3. B plus 275 V out to Rcvr.
4. P.T.T. grounding (AUX.)
5. Ground
6. Bias input (-67 to -75 V)
7. OFF-ON Switch Output

To HV relay high side


5763
56
6146
L21/R12 100
L23
L22
C40 .001
C25 .002
L10
R10 22K
C31 50
C32 33
L16
L17
L18
L19
L20
C26
C27
C28
C29
C30
S5A
S5B
C33
L9
C35 .01
R11 4.7
C36 .01
C37 .01
C38 .002
CV4
CV5
C39 .005
R9 22K
R8 1K
C21 50
C22 .01
C23 .01
C24 .01
Org+Blk-T
J2
ey
TB1-1
R23 100K
CV3
TB1-6
C34 .01
R24 5.6K
TB1-7
R13 100K
R14 4.7
R15 22
R16 4.7K
R17 15K
R18 18K
R19 18K
R20 4.7K
R21 2K
Gry
Red+Blk-T
Yel
Red+Wht-T
Red
Gry
HV-Blu
HV-Org
Yel+Blk-T
Pur
Gry+Red-T
Gry
HV-Blu
Org
TB2-4
TB2-7
Yel+Grn-T
Red+Blk-T
Org+Grn-T
5 GT
HV-Blu
T1
HV Org
HV-Pur
HV-Red
MOD. BIAS
R40 20K
Wht+Red-T
PH.
CW
S13
5 GT
HV-Blu
Org
Red+Wht-T
Yel
Blk
Red
TB2-1
R41 750
TB2-3
F1
F2
F3
B1
Blu
Wht
TB2-6
TB1-4
TB2-5
TB1-3
OB2
OB2
R42 100K



MORROW AMATEUR TRANSMITTER
MODEL MB-565

DRWN. BY W. M. W.	DATE 1-28-58
CHKD. BY G. A. H.	MRS 4
APRD. BY G. E. M.	

MORROW MB-565 TRANSMITTER
SPECIFICATIONS

1. FREQUENCY RANGE:
   3.5-4.0 MC / 75 M 7.0-7.3 MC / 40 M 14.0-14.35 MC / 20 M
   21.0-21.45 MC / 15 M 28.0-29.7 MC / 10 M

2. FREQUENCY CONTROL:
   Variable frequency oscillator or Crystal oscillator.
   Calibrated dial scale for each frequency range.

3. POWER INPUT:
   6 VOC at 6 Amp. or 12 VDC at 3 Amp.
   67.5 VDC at .1 MA
   275 VOC at 90 MA
   300 to 600 VOC at 200 MA

4. POWER OUTPUT:
   3.9 MC 50 watts, 29 MC 40 plus watts.

5. OUTPUT NETWORK ANO IMPEDANCE:
   52-70 ohm pi network

6. ANTENNA SWITCH:
   Antenna switched from receiver to transmitter by built-in relay that is actuated by microphone push-to-talk switch.

7. TYPE OF SPEECH ANO MOOULATORS:
   High level plate and screen using class AB modulators. Full 100% modulation with very low distortion.

8. MICROPHONE:
   Either Carbon or Crystal microphones may be used with no changes required in transmitter.

9. DIMENSIONS ANO WEIGHT:
   10 3/4 pounds, less power supply.
   Size overall: Height 4 1/8 Width 11 7/8 Depth 9 3/8

10. MOUNTING HARDWARE:
    MORROW slide-in JIFFY MOUNTS fo easy installation.

11. RECOMMENDED POWER SUPPLIES:
    MORROW type RVP-260B and TV-600A
    OR
    MORROW type RTV-630 combination power supply

Note 1: Pins 2 to 3 must be jumpered on J5D except when the RVP-260B is used to supply exciter voltage to a transmitter. (B plus output to exciter and T-R relay on J5D #2; B plus return from T-R relay on J5D #3)

Note 2: The jumper connections for 6 volt operation are shown in DASHED lines. The jumper connections for 12 volt operation are shown in DASH DOT lines. When changing operating voltage of the RVP-260B, the jumpers on TB1, TB3 and J4D must be changed.

Note 3: Terminal board TB2 is provided in order that an external transit-receive switch or relay may be used to mute the receiver. The two terminals must be jumpered when the RVP-260B is used with the MB-565 Transmitter.

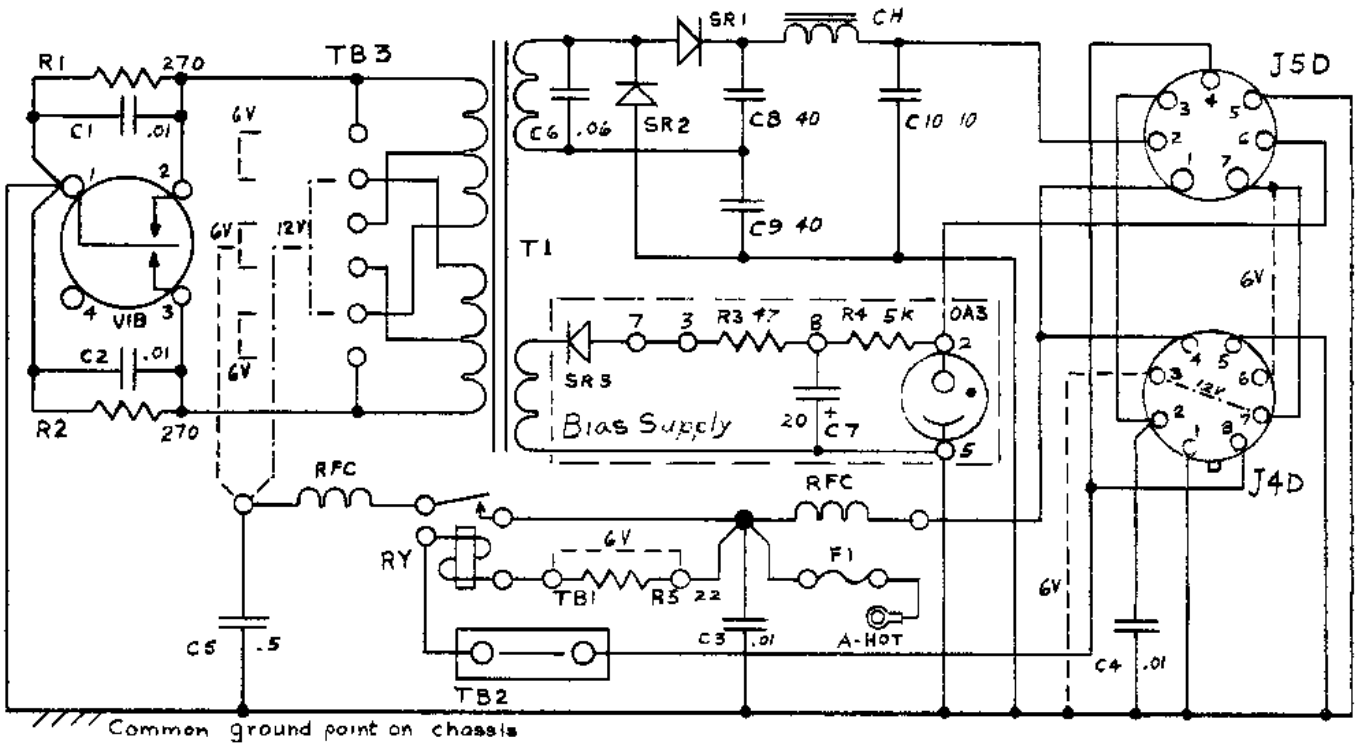
J4D CONNECTIONS:

1. Ground
2. B plus 275V to Rcvr.
3. Rcvr Htr. (12V conn.)
4. Rcvr. OFF-ON Sw. input
5. Ground
6. Rcvr. Htr. (6V Conn)
7. Rcvr. OFF-ON Sw. output
8. B plus RY Keying

J5D CONNECTIONS:

1. Htr. Voltage output (Aux)
2. B plus 275V to Ex.
3. B plus Return from T-R Ry.
4. B plus RY Keying (Aux)
5. Ground
6. Bias Neg 75V
7. OFF-ON Sw. output (Aux)

VIBRATOR POWER SUPPLY MODEL RVP-260/2608 INSTRUCTIONS



MODEL RVP-260 IS WITHOUT BIAS SUPPLY SECTION

NOMINAL RATING 6 or 12 V. INPUT
275 V. 100 MA OUTPUT

MODEL RVP-2608 IS WITH BIAS SUPPLY SECTION

NOMINAL RATING 6 or 12 V. INPUT
275 V. 100 MA OUTPUT No.1
NEG. 75 V. BIAS OUTPUT No.2

PARTS LIST

C1,2-0.01 mfd disc 500v
C3,4-0.01 mfd disc 500v
C5 -0.5 mfd paper 100v
C6 -0.06 mfd paper 1000v
C7 -20 mfd Electro 150v
C8 -40 mfd Electro 250v
C9 -40 mfd Electro 350v
C10 -10 mfd Electro 350v
CH -9 Hy 90 MA choke
F1 -15A on 6v
F1 -7.5A on 12v
J4D -8 pin socket 77-MIP-8
J5D -7 pin socket 77-MIP-7S
OA3 -75 volt VR tube

R1,2-270 ohm ½W.
R3 -47 ohm ½W.
R4 -5K 1 W.
R5 -22 ohm 2 W.
RFC -Hash Filter 108-079
RY -6V DC Relay SPST
SR1,2-Sel Rect 100 MA 160V 106-004
SR3 -Sel Rect 65 MA 135V 106-001
T1 -Transf. Vib. 120-128
VIB -Vib 6 volt: Mallory 659
CD 8301
VIB -Vib 12 volt: Mallory G659
CD G8301