



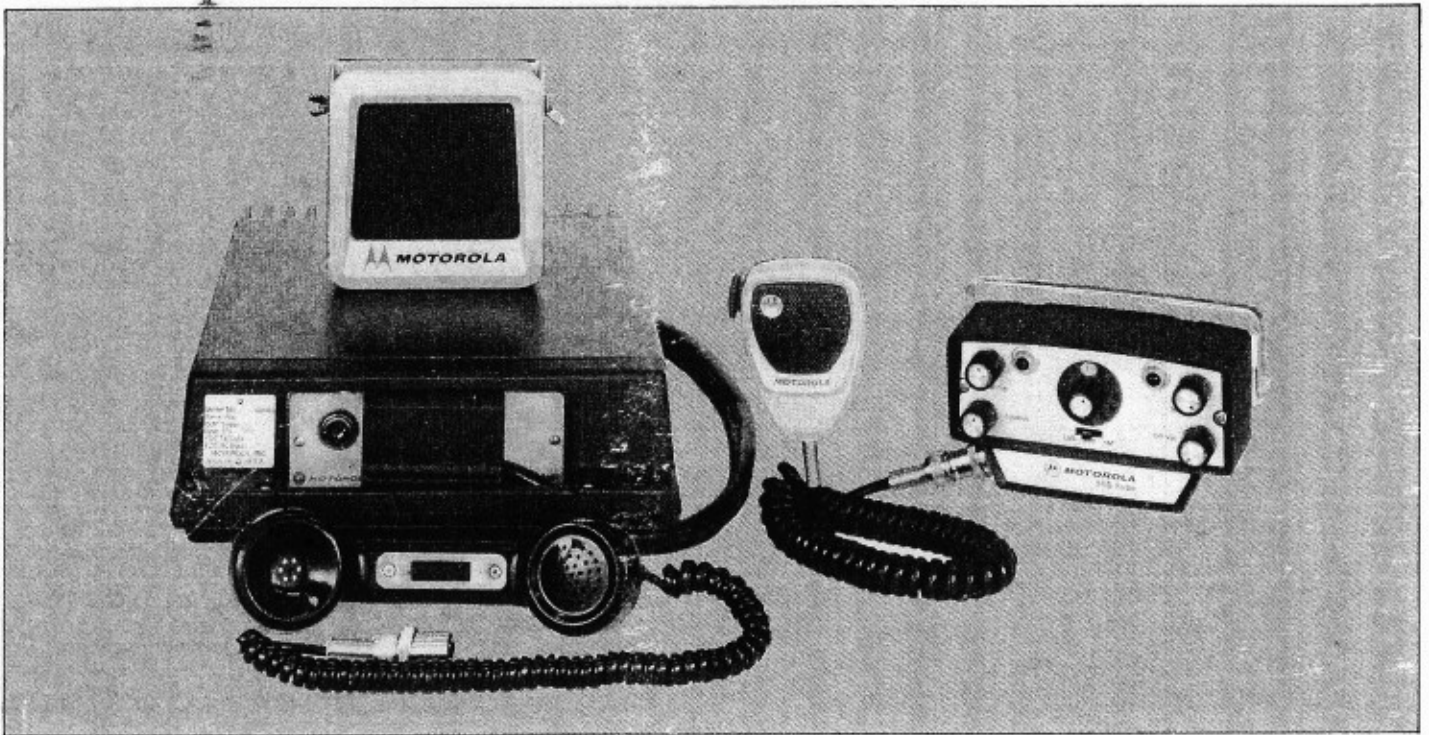
MICOM

HF-SSB Mobile Radio/ Fixed Mobile Radio

2-18/2-9 MHz

125/60 Watts P.E.P.

12V DC Negative Ground



Instruction Manual

1. INTRODUCTION

The Motorola "Micom" Series two-way high frequency single sideband mobile radios are completely solid state and easily tuned. A variety of models are available (see model charts in front of this manual) including dash, trunk, universal, or fixed mountings, 60 or 125 watt PEP transmitters and up to 12 channels selectable by a single switch. Any frequency within the 2 to 18 MHz range can be placed on any of the 12 channels. Up to eight semi-duplex channels (transmit and receive on different frequencies, but not simultaneously) can also be used, which may be used in combination with up to four simplex channels. Duplex operation is available on special order. This multi-channel capability provides the highest probability of HF-SSB communications 24 hours a day. An extensive line of accessories are offered including several types of antennas, "Quik Call·S" Selective Signaling, speakers, handsets, and microphones. Radio options include lower sideband operation (upper sideband is standard), AM receive/AM equivalent transmit operation, a receiver clarifier and a receiver rf gain control. See listing of model options and accessories in the front of this manual.

2. BASIC TYPES OF RADIOS

2.1 "CONSTANT-SINAD" SQUELCH MODELS

These standard models are used when all transmissions on a specific frequency are to be heard. The receivers incorporate a "Constant-SINAD" squelch circuit which mutes the receiver audio when no voice signals are received. This eliminates disturbing noise which would otherwise be heard at the speaker during intervals between received messages.

2.2 "QUIK-CALL·S" SELECTIVE SIGNALING MODELS (OPTIONAL)

2.2.1 This type of radio is an improvement in HF-SSB two-way radio equipment especially when operating under crowded channel conditions. Several "Quik Call·S" users can share the same rf frequency in the same area. Each user is paged using a different code. A group call code is also available.

2.2.2 The transmitters are modulated by a two tone code signal preceding the voice modulation. The receivers accept only correctly coded signals when the "Quik Call·S" unit is in the "muted" mode and reject all others.

2.2.3 "Quik Call·S" selective signaling models also include "Constant-SINAD" squelch circuitry as previously described for "Constant-SINAD" squelch models. This enables the operator to monitor the channel before transmissions ("Quik Call·S" unit in the "unmuted" mode) and prevent interference with other users of the frequency. Microphones supplied with "Quik Call·S" stations have a MONITOR switch incorporated into the microphone hang-up box to permit switching to the "Constant-SINAD" squelch circuit for monitoring purposes before transmitting. In fixed mobile installations, this switch is incorporated into the desk microphone used with the station.

2.2.4 The SQUELCH control has no effect on "Quik Call·S" squelch sensitivity. In normal operation ("Quik Call·S" in the "muted" mode), the receiver audio is activated when the on-frequency rf signal is modulated with the proper code to activate the "Quik Call·S" decoder. "Quik Call·S" Selective Signaling units are described in manual 68P81106E86.



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3. DESCRIPTION OF UNITS

3.1 RADIO SET

3.1.1 Physical Description

3.1.1.1 The basic radio set is a compact, single drawer type with the transmitter and receiver assembled in a fully enclosed housing. In trunk mount models, a compact control group, consisting of the control head, palm microphone and speaker, provides total radio control from the driver's compartment. Refer to Figure 1. The radio unit itself may be mounted in any convenient location: under a seat, in the trunk, or even overhead. 5.2 meters (17 feet) of cable are included to connect the control group

to the radio unit. A universal mounting kit is standard. In front-mount models, the radio unit includes an integral speaker and a sloping front panel places the operating controls within easy reach. See Figure 2. Fixed station models are similar to front mount but are supplied with a ac power supply and fixed station microphone. Universal mount radios are supplied less the control head and accessories.

3.1.1.2 The radio set is constructed with printed circuits functionally separated into modules which plug into a master interconnect board. A diagram on the bottom of the main circuit board identifies the test points of each module, and the bottom of the master interconnect board serves as a circuit board test

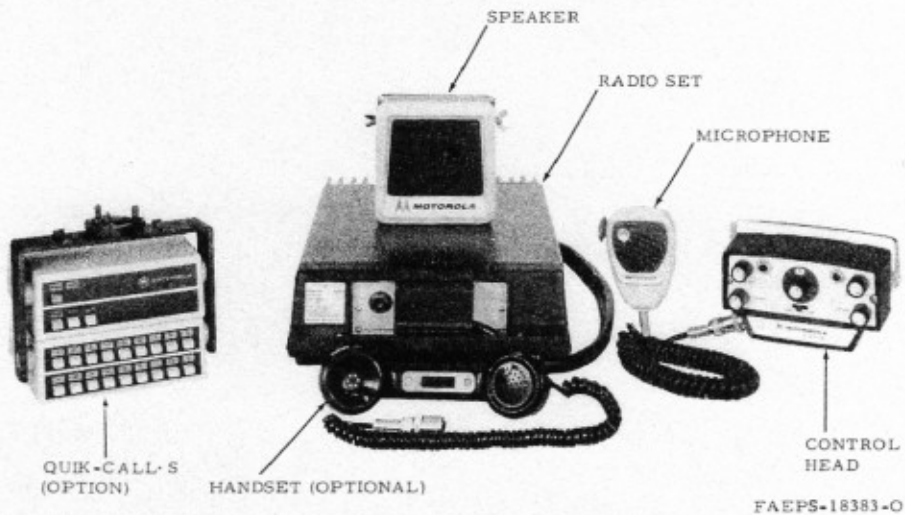


Figure 1. Trunk Mount Mobile Unit with Accessories



Figure 2. Front Mount Unit with Accessories

fixture. Testing the circuitry of a module is accomplished easily and rapidly by simply removing it and inserting it in the proper position on the bottom of the interconnect board. This allows full access to all test points while power is applied to the radio. (A circuit board extractor tool is included to simplify removal and replacement of modules.)

3.1.1.3 The "Micom" radio operates directly from the vehicle's battery. The unit is designed for 12 V dc negative ground operation.

3.1.2 Transmitter Features

3.1.2.1 The transmitter fully complies with all applicable International Radio Consultive Committee (CCIR) and U. S. A. Federal Communications Commission (FCC) requirements. Transmitter emissions are designated A3J (single sideband, carrier suppressed at least 43 dB below PEP). A3H emissions (AM equivalent, one sideband plus carrier 3 to 6 dB below PEP) is used for the optional AM operation.

3.1.2.2 The rf output, depending upon model, is either 60 or 125 watts peak envelop power (PEP is that power supplied to the antenna transmission line by the transmitter during one rf cycle at the highest crest of the modulation envelop). Nominal output impedance is 50 ohms and the transmitter operates with at least 75 watts (40 watts for 60 watt models) into a 2:1 VSWR antenna mismatch. The transmitter uses a transmitter audio gain control (TGC) circuit in conjunction with a power amplifier automatic level control (ALC) to limit the maximum PEP to the rated value. Performance of these circuits are such that a 10 dB increase in audio input level from that required for one-half rated PEP will not increase power output above full rated PEP.

3.1.2.3 The power amplifier (mounted on, but not a part of the universal radio chassis) is equipped with protective circuitry which prevents overdissipation of the final transistors if there is an antenna mismatch (high VSWR) or if the PA heatsink temperature becomes excessive.

3.1.2.4 No transmitter tuning adjustments are required other than the frequency adjustment (warp) of the local oscillator to the desired transmit frequency.

3.1.2.5 Transmitter and receiver frequencies are derived from common

oscillators. The oscillators use quartz crystals heated in a proportionally-controlled oven. The oven is protected by a thermal fuse. The oscillators maintain the transmitter frequency ± 20 Hz over the rated temperature range. Radios can be tuned to any frequency in the 2.0 to 18 MHz range except for a forbidden zone of ± 600 kHz centered on the i-f frequency of 10.8 MHz. If channels within the forbidden zone are required, a shifted i-f option can be used to shift the i-f to either 11.4 MHz or 12.0 MHz. In each case, the forbidden zone is ± 600 kHz.

3.1.2.6 The transmit lamp is an rf derived indication that adequate forward power is being transferred to the antenna. It also provides a system check since the indicator will not light if power output is below a predetermined level.

3.1.3 Receiver Features

3.1.3.1 The receiver is of the single-conversion superheterodyne type with two crystal-controlled local oscillators. Usable sensitivity is at least 0.5 microvolt for a 10 dB SINAD ratio. Selectivity is provided by an 8-pole crystal filter ahead of the major gain determining elements to minimize intermodulation effects. The crystal filter provides at least 60 dB rejection to signals at frequencies greater than 4000 Hz above and 800 Hz below the 'carrier' frequency (in the USB mode). Audio response is 350 Hz to 2700 Hz and the receiver can deliver at least 5 watts into a 3.2 ohm speaker with less than 10 per cent distortion.

3.1.3.2 The receiver uses a constant-SINAD type of squelch which responds to fm variations in voice signals at syllabic rates. The squelch opens when voice signals corresponding to a SINAD of 10 dB or more are received. The squelch circuit is insensitive to absolute signal levels, AGC voltage levels, long-term noise, and transient noise (such as ignition noise). It does not respond to steady tones.

3.1.3.3 Radio sets in the 2-18 MHz range often utilize refraction (bending) of radio waves in the ionosphere to gain transmission range. However, the ionosphere is an unstable refracting medium. As a result, signal levels at the receiver are normally subject to fading of a few dB and, at times, deep fading of 10 to 20 dB or more. To assure a solid, readable signal under these conditions, the receiver is equipped with a dual time-constant decay AGC with wide dynamic range. The AGC threshold

is 10 microvolts or less and provides less than a 10 dB change in audio output over the 100 dB range of 10 microvolts to 1 volt rf input. The AGC distribution is such that up to 40 dB of attenuation is provided at the rf amplifier with the remainder occurring in the i-f amplifier. This distribution assures good intermodulation protection. An optional rf gain control enables the operator to adjust the rf attenuator manually. This can sometimes improve reception when interfering signals are present. Its use is not required or recommended under normal conditions because of the possibility of missing weak signals.

3.1.3.4 An optional "Constant Range" clarifier circuit is available which permits the operator to manually tune the receiver ± 200 Hz as an aid in receiving signals from a transmitter which may be slightly off frequency.

3.2 CONTROL HEAD, SPEAKER, AND MICROPHONE

3.2.1 The basic control head contains power on and transmit indicators, the channel selector switch, squelch control, and power off/volume control. In trunk-mount radios it is trunnion mounted near the operator. In front mount and fixed mobile radios it is incorporated into the front of the radio chassis.

3.2.2 The mobile microphone consists of a palm-type housing which encloses a push-to-talk switch and a dynamic cartridge which incorporates an rf immune transistorized amplifier.

3.2.3 The desk microphone for fixed mobile applications is a ceramic type containing a transistorized preamplifier. It contains a transmit switch, and, if the optional "Quik-Call S" signaling is used, a monitor switch.

3.2.4 The speaker is also trunnion-mounted near the operator with trunk mounted radios and is built into the control head for other models.

3.3 POWER SUPPLY

The power supply, used with fixed mobile stations, is a regulated unit providing all necessary dc voltages for operation of the associated transmitter-receiver and optional accessories. It can operate from 100, 110, 121, 200, 210, 221, 231, and 242 V ac $\pm 20\%$, 50 or 60 Hz. The power supply consists of a power transformer, full-wave rectifier, series transistor regulator, and associated control circuits assembled on a compact chassis. The power supply is packaged in a separate housing which can be easily removed to facilitate maintenance. The output of the power supply is connected to the transmitter-receiver via a connector located on the rear of

the radio chassis. The all solid-state power supply incorporates a large heat sink, rugged power transistors, and fully fused input and output stages.

4. OPTIONS

Model options are summarized in the list at the front of this manual.

4.1 S118 SERIES RF GAIN CONTROL

This option adds a manual rf gain control to the control head. It is used for manually adjusting receiver sensitivity as an aid in receiving weak signals when strong off-channel interfering signals are also present.

4.2 S119 SERIES CLARIFIER

This option adds a manual receiver clarifier control to the control head. It is used to fine tune the receiver up to ± 200 Hz as an aid in receiving signals from a transmitter which is slightly off frequency.

4.3 S120 SERIES COMPATIBLE AM OPERATION

This option adds an am receiver which provides high-quality reception of "true am", or AME signals A3H. The am receiver includes a wider bandwidth crystal filter, amplification stages, an am detector, and independent AGC circuitry having a dynamic range of 100 dB. The MODE switch on the front panel is used to select am reception. When in the am mode, the transmitter operates in the AME (am-equivalent) mode (A3H).

4.4 S122 SERIES LOWER SIDEBAND OPERATION

This option adds an additional crystal filter for lower sideband operation. A switch also added to the control head to permit selection of either the upper (standard) or lower sideband.

4.5 OPTION S228 & S229 SERIES SHIFTED

These options provide for shifting the radio i-f frequency from the standard 10.8 MHz to 11.4 MHz (S228) or 12.0 MHz (S229). They are used when operation within ± 600 kHz of the standard i-f is required. The forbidden band of the shifted i-f is also ± 600 kHz.

4.6 S51AA IGNITION NOISE REDUCTION KIT

This option provides instructions and components useful in reducing interference due to vehicle ignition noise. The kit includes coaxial capacitors, resistance wire, hoodwiper, and hardware. One kit is standard with each mobile radio. Additional kits may be ordered as this option.

4.7 S113AA IGNITION RELAY BATTERY SAVER

This option adds an ignition relay used to control battery voltage to the radio set so that power is removed when the vehicle ignition switch is set to off. This option prevents draining of the battery when the vehicle is turned off and the radio power switch is left on. It also provides protection against unauthorized use.

4.8 OPTIONS FOR HANDSETS AND HANG-UP BOXES

These options add a handset in place of the palm microphone/speaker normally supplied. Option S109AA is for noise squelch radio sets. Option S109AB is for radios using "Quik Call-S" selective signaling.

4.9 S549AA 15 W "POWER VOICE" SPEAKER

This option adds a 15 watt audio amplifier contained in a speaker housing and powered from the control head. This unit is described in manual 68P862337.

4.10 OPTIONS TO DELETE CRYSTALS

Standard models of the radio set include a full set of 12 crystals. If all are not needed, they may be deleted, as required, by ordering options S521A thru S532A to delete from 1 to 12 crystals respectively.

4.11 OPTIONS FOR "QUIK CALL-S" SELECTIVE SIGNALING

These options add selective signaling (paging) to the MICOM HF-SSB radio sets. An encoder is added to the transmitter which generates a tone code consisting of two sequential tones which modulate a pilot subcarrier. The code is normally transmitted to establish contact with another station. Each receiver is equipped with a decoder which disables the audio output of the receiver until the correct "Quik Call-S" code is received. Several models are available:

OPTION SERIES	DESCRIPTION
S156/C156	One code encode only
S157/C157	Six code encode*only
S159/C159	30 code encode**only
S252/C252	One code encode/One code decode
S253/C253	Six code encode*/One code decode
S254/C254	30 code encode**/One code decode
S255/C255	Additional reeds for code expansion
S256/C256	Additional reeds for individual and group decode
S562/C562	One code decode only

*Reeds supplied for 6 codes. Maximum capacity is 20 codes with additional reeds.

**Reeds supplied for 30 codes. Maximum capacity is 72 codes with additional reeds.

The "Quik Call-S" Selective Signaling unit mounts in a separate trunion-mounted unit. It is described in manual 68P81106E86.

5. ANTENNA SYSTEMS

The mobile radios are supplied less the antenna system. The following antenna systems are available; However, selection should be made by a qualified communications representative. Contact your local Motorola radio communications representative for your antenna selection and ordering needs.

5.1 SINGLE-CHANNEL MOBILE ANTENNA

For single frequency operation, Model TAA6011A (2.7-6.7 MHz) and TAA6012A (6-15 MHz) Antennas are available. They are 11-foot, 5-inch (3.5 meter) whip antennas and include a choice of side or bumper mounts, 18-foot of RG-58A/U Coaxial Cable and a connector for the cable. A TRN6330A Mobile Antenna Tuner is also required (not part of antenna kit). The tuner mounts at the base of the antenna. These antennas and the tuner are described in manual 68P81107E16.

5.2 SIX-CHANNEL ANTENNA

The TAA6000A Six-Channel Mobile Antenna is a bumper mount 10'5" (3.2 meter) whip with built-in six-channel tuner. Mounts and antenna cable for trunk-mounted radios (8 feet or 2.4 meter) are supplied with the antenna. A TKN6793A Cable Kit is available for front (dash)

PERFORMANCE SPECIFICATIONS

GENERAL

MODEL NO.	See model chart
NO. OF CHANNELS	12 simplex; up to 8 half duplex channels on special order
FREQUENCY RANGE	2-9 MHz or 2-18 MHz
IF FREQUENCY	10.8 MHz standard. May be shifted to 11.4 or 12.0 MHz.
INOPERATIVE FREQUENCIES	±600 kHz of i-f
OPERATING TEMPERATURE	-30°C to +60°C
PRIMARY VOLTAGE	13.4 volts nominal ±20% (mobile) 100/110/121/200/210/221/231/242 V AC (±20%) 50/60 Hz and 12 V DC negative ground (fixed mobile)
CURRENT DRAIN: (OVEN STABILIZED @ 25°C AMBIENT)	Receive - Standby: 1.7 amperes @ 13.8 V dc Full audio: 2.1 amperes @ 13.8 V dc Transmit - 60 watts voice: 9 amps average; 2-tone P. E. P., 13 amps 125 watts voice: 13 amps average; 2-tone P. E. P., 21 amps
CONTROLS	On-Off/Volume, Squelch, Channel Select, Optional Clarifier, Optional RF Gain, Optional AM, LSB, USB Switch
SIZE	Trunk Mt: 10.2 cm (4") H x 27.9 cm (11") W x 42.5 cm (16.75") D Front Mt: 10.2 cm (4") H x 27.9 cm (11") W x 45.7 cm (18") D Fixed Mob: 10.2 cm (4") H x 27.9 cm (11") W x 45.7 cm (18") D
WEIGHT	Front Mt: 13.4 kg (29.5 lbs.) Trunk Mt: 11.36 kg (25 lbs.) (radio unit only) Fixed Mob: 13.4 kg (29.5 lbs.)

Shipping Wt.
(including accessories)
18.4 kg (40 lb)

TRANSMITTER

OUTPUT POWER	125 watts or 60 watts P. E. P.
INTERMODULATION	-31 dB reference to P. E. P.
SPURIOUS & HARMONIC EMISSIONS	-64 dB reference to 125 watts P. E. P. -61 dB reference to 60 watts P. E. P.
CARRIER SUPPRESSION	At least -43 dB
TRANSMISSION MODES	A3J, A3H
UNDESIRE SIDE BAND SUPPRESSION	1 kHz tone, 60 dB below P. E. P.
AUDIO DISTORTION	5% total distortion
FREQUENCY STABILITY	±20 Hz, -30°C to +60°C

FCC Designation:

MODEL SERIES	TRANSMITTER PEAK ENVELOPE POWER (P. E. P.)	FREQUENCY RANGE	APPLICABLE PARTS OF RULES	EMISSION AUTHORIZED	TYPE ACCEPTANCE NUMBER
U/T/D80SCA	125 Watts	2-18 MHz	87, 89, 91	A3H, A3J	CC1120
U/T/D80SBA	125 Watts	2-9 MHz	87, 89, 91	A3H, A3J	CC1121
U/T/D50SCA	60 Watts	2-18 MHz	87, 89, 91	A3H, A3J	CC1118
U/T/D50SBA	60 Watts	2-9 MHz	87, 89, 91	A3H, A3J	CC1119

NOTE: Part 87 applies to airborne stations only. Not type accepted under paragraph 87.65 for ground stations.

PERFORMANCE SPECIFICATIONS (Cont'd.)

MOBILE ANTENNAS AVAILABLE

MODEL	TAA6000A	TAA6011A	TAA6012A	TDA6030A/ TDA6040A
FREQ. RANGE	2-18 MHz	2.7-6.7 MHz	6.0-15 MHz	2.0-18 MHz
CHANNELS	6	1	1	12
TUNING	Preset/Automatic	Manual	Manual	Preset/Automatic
INPUT IMPEDANCE	52 Ohms	52 Ohms	52 Ohms	52 Ohms
POWER CAPACITY	125 Watts P. E. P.	125 Watts P. E. P.	125 Watts P. E. P.	125 Watts P. E. P.
VSWR	Less than 2:1	Less than 1.2:1	Less than 1.2:1	Less than 2:1
ANTENNA LENGTH	3.2 meters (10'5")	3.5 meters (11'5")	3.5 meters (11'5")	4.9 meters (16')
NET WEIGHT	7.71 kg (17 lbs.)	4.08 kg (9 lbs.)	4.08 kg (9 lbs.)	1.87 kg (4 lbs.)
	Dash Mount Requires TKN6793A Extended Cable Kit	Requires TRN6330A Interface Unit	Requires TRN6330A Interface Unit	Requires TRN6439A or TRN6438A

RECEIVER

SENSITIVITY	10 dB Sinad: 0.5 μ V 1/2 Rated Audio Power: 1.0 μ V
SELECTIVITY	(-6 dB minimum) 350 Hz to 2700 Hz
SPURIOUS	(Ref. 10 dB Sinad) Image: At least 80 dB All Others: At least 65 dB
INTERMODU- LATION	At least 70 dB
CROSS MODULATION (100 kHz SEPARATION)	100 dB, 2-9 MHz 95 dB, 9-18 MHz
DESENSITIZATION (100 kHz SEPARATION)	100 dB, 2-9 MHz 95 dB, 9-18 MHz
FREQUENCY STABILITY	\pm 20 Hz, -30°C to +60°C
AUDIO OUTPUT	5 watts with less than 10% total distortion
AGC CHARACTER- ISTIC	Audio output varies less than 10 dB for signals between 10 μ V and 1 volt (100 dB range). Dual slope, fast attack, slow decay AGC threshold -10 μ V or less.
SQUELCH	Constant Sinad

OPTIONAL AM RECEIVER

SENSITIVITY	10 dB SINAD: 3.0 μ V, 1/2 rated Audio Power: 3.0 μ V
AUDIO RESPONSE:	(-6 dB Minimum Passband): 350 Hz to 2700 Hz
SPURIOUS:	(reference 10 dB SINAD): Image: at least 65 dB, All others: at least 50 dB
INTERMODULA- TION	55 dB
CROSS MODULA- TION (100 kHz SEPARATION)	80 dB
DESENSITIZA- TION (100 kHz SEPARATION)	80 dB
AGC CHARAC- TERISTICS	Less than 10 dB audio change for 100 dB input change (10 μ V to 1 volt rf input)

E2

MOTOROLA

MODEL CHART FOR
 "MICOM" HF-SSB MOBILE RADIOS
 TRUNK/UNIVERSAL/FRONT MOUNT & FIXED MOBILE
 60/125 WATTS 2-9 MHz OR 2-18 MHz
 USB ONLY, 12 V NEGATIVE GROUND, 12T-12R

NOTE

FRONT MOUNT AND FIXED MOBILE MODEL INFORMATION IS INCOMPLETE IN THIS ISSUE OF MANUAL. (THESE MODELS ARE NOT AVAILABLE AS OF THE DATE OF ISSUE.) DATA WILL BE SUPPLIED IN A MANUAL REVISION WHEN AVAILABLE.

CODE:

- = ONE SUPPLIED
- = STANDARD MODEL INCLUDES 12, ONE FOR EACH OPERATING FREQUENCY. OPTIONS CAN DELETE CRYSTALS.
- = ONE SUPPLIED PER FIVE RADIOS

KIT OR CHASSIS	DESCRIPTION	MODEL NUMBER										POWER OUTPUT	FREQ RANGE (MHz)															
		T505BA	1800AK	T505CA	1800AK	T805BA	1800AK	T805CA	1800AK	U505BA	1800AA			U505CA	1800AA	T505BA	1800AA	T505CA	1800AA	D505BA	1800AK	D505CA	1800AK	D505BA	1800AM	D505CG	1800AM	D505CG
TUA1010A	UNIVERSAL RADIO CHASSIS, 2-9 MHz	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TUA1020A	UNIVERSAL RADIO CHASSIS, 2-18 MHz	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TLN1751A	POWER AMPLIFIER, 60 W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TLN1752A	POWER AMPLIFIER, 125 W	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6289A	PA CONNECTOR & HARDWARE KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TFA1001A	HARMONIC FILTER, 2-9 MHz	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TFA1002A	HARMONIC FILTER, 2-18 MHz	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6230A	PROGRAMMING BOARD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6241A	USB FILTER BOARD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THN6246A	MOBILE HOUSING ASSEMBLY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6239A	MOBILE FRONT PANEL ASSEMBLY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6202A	A+ FILTER (FOR ALTERNATOR WHINE)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TKN6777A	CABLE KIT (RADIO TO CONTROL HEAD)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TKN6774A	CABLE KIT, TRUNK MTG (RADIO TO FUSES)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TKN6776A	CABLE & FUSE (GREEN) (BATTERY LO CURRENT)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TKN6458A	CABLE & FUSE (RED) (BATTERY HI CURRENT)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TCN6197A	CONTROL HEAD (SQ, VOL, USB)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TSN6023A	SPEAKER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMN1014A	MICROPHONE, BASE STATION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TMN6114A	MICROPHONE, CONSTANT-SINAD SQUELCH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TLN8845A	IGNITION NOISE SUPPRESSION KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TRN6377A	TUNE UP KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
KXN6123AA	CRYSTAL KIT, 10.8 MHz I-F	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TKN6775A	CABLE AND CONNECTOR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TLN6042A	INSTALLATION KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THN6275A	MOBILE HOUSING KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TCN6236A	CONTROL HEAD (SQ, VOL, USB)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
THN6281A	FIXED MOBILE HOUSING ASSEMBLY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TPN1150A	POWER SUPPLY KIT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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LIST OF OPTIONS

OPTION	ADD	DELETE	APPLICABILITY
S101AA	TKN6832A Cable	TKN6830A Cable	Front Mount
S109AA	TMN6115A Handset (SINAD Squelch)	TMN6114A Microphone	Trunk Mount
	TLN6498A Handset Hang-up Switch Box		
S109AB	TMN6115A Handset ("Quik-Call-S" Squelch)	TMN6114A Microphone	Trunk Mount
	TLN4507A Handset Hang-up Switch Box		
S109AC	TMN6115A Handset (SINAD Squelch)	TMN6114A Microphone	Front Mount
	TLN5843A Handset Hang-up Switch Box		
S109AD	TMN6115A Handset ("Quik-Call-S" Squelch)	TMN6114A Microphone	Front Mount
	TLN5844A Handset Hang-up Switch Box		
S113AA	TRN6178A Ignition Control Relay		Trunk and Front Mount
S118AA	Add RF gain control: Control Head. See model table	Standard Control Head	Trunk Mount
S118AB	Add RF gain control: Control Head. See model table.	Standard Control Head	Front Mount and Fixed Mobile
S119AA	Add clarifier control: Control Head. See model table	Standard Control Head	Trunk Mount
S119AB	Add clarifier control. Control Head; See model table	Standard Control Head	Front Mount & Fixed Mobile
S120AA	Add AM operation: TRN6240A AM Receiver Board (10.8 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S120AB	Same as 120AA	Standard Control Head	Front Mount & Fixed Mobile
S120AC	Add AM operation: TRN6436A AM Receiver Board (11.4 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S120AH	Same as 120AC	Standard Control Head	Front Mount & Fixed Mobile
S120AD	Add AM operation: TRN6437A AM Receiver Board (12.0 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S120AJ	Same as 120AD	Standard Control Head	Front Mount & Fixed Mobile
S122AA	Add Lower Sideband Operation: TRN6242A USB/LSB Filter (10.8 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S122AK	Same as S122AA	Standard Control Head	Front Mount & Fixed Mobile
S122AE	Add Lower Sideband Operation: TRN6246A USB/LSB Filter (11.4 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S122AL	Same as 122AE	Standard Control Head	Front Mount & Fixed Mobile
S122AF	Add Lower Sideband Operation: TRN6247A USB/LSB Filter (12.0 MHz i-f), Control Head. See model table	Standard Control Head	Trunk Mount
S122AM	Same as S122AF	Standard Control Head	Front Mount & Fixed Mobile
S51AA	Ignition Noise Reduction Kit		Trunk & Front Mount
S102AA	Hallet Signal Saver Kit		All Models
S549AA	15 W "POWER VOICE" Speaker		Trunk Mount

LIST OF OPTIONS (CONT'D.)

OPTION	ADD	DELETE	APPLICABILITY
S228AA	Shifted i-f; 11.4 MHz: TUA1050A 2-9 MHz Universal Radio Chassis Board TRN6434A USB Filter Board Kit	TUA1010A 2-9 MHz Universal Radio Chassis TRN6241A USB Filter Board	All Models
S228AB	Shifted i-f; 11.4 MHz: TUA1060A 2-18 MHz Universal Radio Chassis TRN6434A USB Filter Board KXN6123AC Crystals (12)	TUA1020A 2-18 MHz Universal Radio Chassis TRN6241A USB Filter Board KXN6123AA Crystals (12)	All Models
S229AA	Shifted i-f; 12.0 MHz: TUA1070A 2-9 MHz Universal Radio Chassis TRN6435A USB Filter Board KXN6123AD Crystals (12)	TUA1010A 2-9 MHz Universal Radio Chassis TRN6241A USB Filter Board KXN6123AA Crystals (12)	All Models
S229AB	Shifted i-f; 12.0 MHz: TUA1080A 2-18 MHz Universal Radio Chassis TRN6435A USB Filter Board KXN6123AD Crystals (12)	TUA1020A 2-18 MHz Universal Radio Chassis TRN6241A USB Filter Board KXN6123AA Crystals (12)	All Models
S521AA through S532AA		Crystals (Qty. 1-12 respectively)	All Models with standard IF.
S521AB through S532AB		Crystals (Qty. 1-12 respectively)	All Models with option S228, 11.4 MHz shifted IF.
S521AC S532AC		Crystals (Qty. 1-12 respectively)	All Models with option S229, 12.0 MHz shifted IF.

"QUIK-CALL-S" OPTIONS

S562AA	Decode only TLN1773A		Trunk Mount
C562AA	Decode only TLN1774A		Fixed Mobile
S562AB	Decode only TLN1828A		Front Mount
S156AB	1 code Encode only TLN1775A		Trunk Mount
C156AB	1 code Encode only TLN1776A		Fixed Mobile
S156AC	1 code Encode only TLN1829A		Front Mount
S157AA	*20 code Encode only TLN1777A		Trunk Mount
C157AA	*20 code Encode only TLN1778A		Fixed Mobile
S157AB	*20 code Encode only TLN1830A		Front Mount
S159AA	+72 code Encode only TLN1779A		Trunk Mount
C159AA	+72 code Encode only TLN1780A		Fixed Mobile
S159AB	+72 code Encode only TLN1831A		Front Mount
S252AA	1 code Encode W/Decode TLN1781A		Trunk Mount
C252AA	1 code Encode W/Decode TLN1782A		Fixed Mobile
S252AB	1 code Encode W/Decode TLN1832A		Front Mount
S253AA	*20 code Encode W/Decode TLN1783A		Trunk Mount
C253AA	*20 code Encode W/Decode TLN1784A		Fixed Mobile
S253AB	*20 code Encode W/Decode TLN1833A		Front Mount
S254AA	+72 code Encode W/Decode TLN1785A		Trunk Mount
C254AA	+72 code Encode W/Decode TLN1786A		Fixed Mobile
S254AB	+72 code Encode W/Decode TLN1834A		Front Mount
S255AA	TLN6824A Vibrasender		Trunk Mount
C255AA	TLN6824A Vibrasender		Fixed Mobile
S255AB	TLN6824A Vibrasender		Front Mount
S256AA	TLN6709B Vibrasponder		Trunk Mount
C256AA	TLN6709B Vibrasponder		Fixed Mobile
S256AB	TLN6709B Vibrasponder		Front Mount

LIST OF OPTIONS FOR UNIVERSAL MOUNT RADIOS ONLY

OPTION	ADD	DELETE
S120AE	Add AM Operation: TRN6240A AM Receiver Board (10.8 MHz i-f)	-
S120AF	Add AM Operation: TRN6436A AM Receiver Board (11.4 MHz i-f)	-
S120AG	Add AM Operation: TRN6437A AM Receiver Board (12.0 MHz i-f)	-
S122AG	Add Lower Sideband Operation TRN6242A USB/LSB Filter (10.8 MHz i-f)	-
S122AH	Add Lower Sideband Operation TRN6246A USB/LSB Filter (11.4 MHz i-f)	-
S122AJ	Add Lower Sideband Operation TRN6247 USB/LSB Filter (12.0 MHz i-f)	-

*Reeds supplied for 6 codes. Maximum capacity is 20 codes with additional reeds.

+Reeds supplied for 30 codes. Maximum capacity is 72 codes with additional reeds.

CONTROL HEAD MODEL TABLE

CONTROL HEAD MODEL						
Trunk Mount	Fixed Station & Front Mount	Options Used				
TCN6182A	TCN6221A	RFG	CLAR	LSB	USB	AM
TCN6183A	TCN6222A	RFG	CLAR	LSB	USB	
TCN6184A	TCN6223A	RFG	CLAR		USB	AM
TCN6185A	TCN6224A	RFG	CLAR		USB	
TCN6186A	TCN6225A	RFG		LSB	USB	AM
TCN6187A	TCN6226A	RFG		LSB	USB	
TCN6188A	TCN6227A	RFG			USB	AM
TCN6189A	TCN6228A	RFG			USB	
TCN6190A	TCN6229A		CLAR	LSB	USB	AM
TCN6191A	TCN6230A		CLAR	LSB	USB	
TCN6192A	TCN6231A		CLAR		USB	AM
TCN6193A	TCN6232A		CLAR		USB	
TCN6194A	TCN6233A			LSB	USB	AM
TCN6195A	TCN6234A			LSB	USB	
TCN6196A	TCN6235A				USB	AM
TCN6197A*	TCN6236A*				USB	

RFG = Rf Gain Control

CLAR = Clarifier Control

LSB = Lower Sideband

USB = Upper Sideband (Standard)

AM = AM operation

* Standard Models

MOTOROLA

KIT & CHASSIS BREAKDOWN
FOR
"MICOM" HF - SSB MOBILE
& FIXED MOBILE RADIOS

ASSEMBLY MODEL	DESCRIPTION	KIT OR CHASSIS	DESCRIPTION
TUAI010A	UNIVERSAL RADIO CHASSIS, 2-9 MHz, 10.8 MHz I-F		CABLE KIT
TUAI020A	UNIVERSAL RADIO CHASSIS, 2-18 MHz, 10.8 MHz I-F		9 V REGULATOR
LN1751A	60 W POWER AMPLIFIER		AUDIC BOARD
LN1752A	125 W POWER AMPLIFIER		SQUELCH BOARD
TFAI001A	HARMONIC FILTER KIT, 2-9 MHz		1ST MIXER BOARD
TFAI002A	HARMONIC FILTER KIT, 2-18 MHz		I-F BOARD
TRAI000A	RADIO SUBCHASSIS, 2-9 MHz		2ND MIXER BOARD
TRAI010A	RADIO SUBCHASSIS, 2-18 MHz		TRANSMIT/RECEIVE SWITCH BOARD, 10.8 MHz I-F
TPN1150A	POWER SUPPLY		INJECTION SWITCH BOARD
	OPTIONS		MAIN BOARD
TUAI050A	UNIVERSAL RADIO CHASSIS, 2-9 MHz, 11.4 MHz I-F		CHASSIS & BRACKET
TUAI060A	UNIVERSAL RADIO CHASSIS, 2-18 MHz, 11.4 MHz I-F		UNIVERSAL RADIO CHASSIS HARDWARE KIT
TUAI070A	UNIVERSAL RADIO CHASSIS, 2-9 MHz, 12.0 MHz I-F		DOUBLER BOARD
TUAI080A	UNIVERSAL RADIO CHASSIS, 2-18 MHz, 12.0 MHz I-F		EXCITER FILTER BOARD
			FRONT END FILTER BOARD, 10.8 MHz I-F
			EXCITER FILTER BOARD
			BOTTOM COVER
			60 W POWER AMPLIFIER BOARD
			60 W HEATSINK
			125 WATT POWER AMPLIFIER BOARD
			125 WATT HEATSINK
			HARMONIC FILTER KIT, 2-9 MHz
			HARMONIC FILTER KIT, 2-18 MHz
			FILTER HOUSING, 2-9 MHz
			FILTER HOUSING, 2-18 MHz
			I-F CRYSTAL KIT, 10.8 MHz I-F
			FINAL FILTER
			RADIO SUBCHASSIS, 2-9 MHz
			RADIO SUBCHASSIS, 2-18 MHz
			TRANSMIT/RECEIVESWITCH BOARD, 11.4 MHz I-F
			FRONT END FILTER, 11.4 MHz I-F
			I-F CRYSTAL KIT, 11.4 MHz I-F
			TRANSMIT/RECEIVESWITCH BOARD, 12.0 MHz I-F
			FRONT END FILTER, 12.0 MHz I-F
			I-F CRYSTAL KIT, 12.0 MHz I-F
			POWER SUPPLY CIRCUIT BOARD
			POWER SUPPLY CHASSIS
			POWER SUPPLY WIRING KIT
			POWER SUPPLY HOUSING

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E7

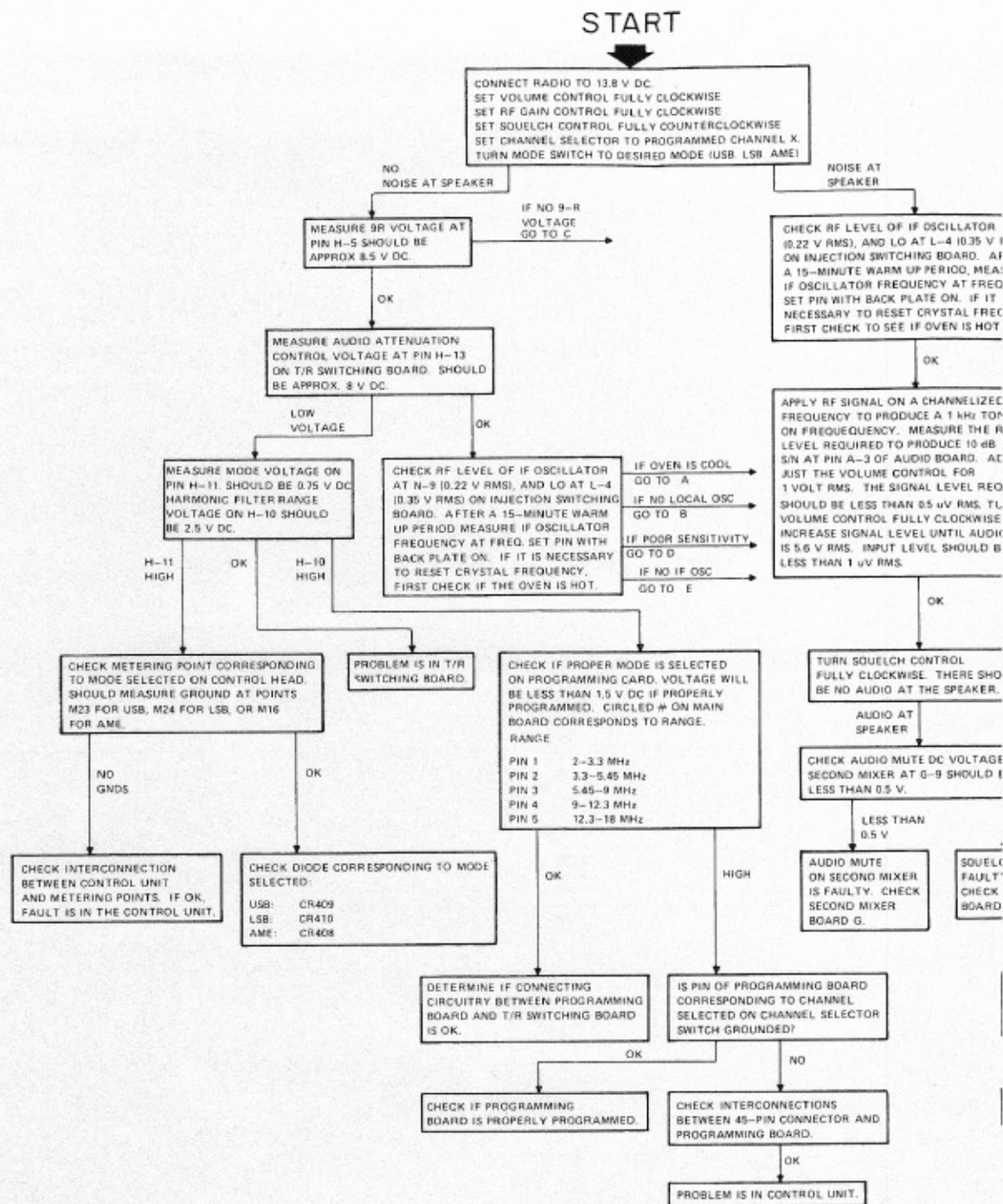
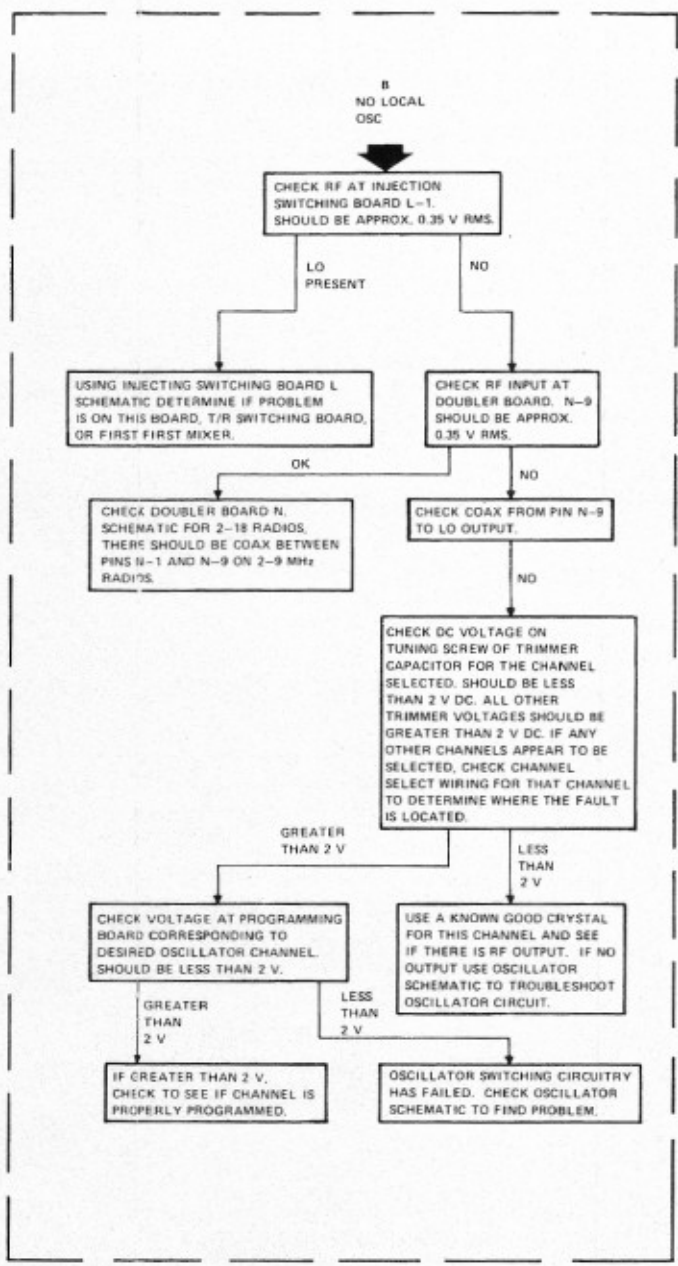
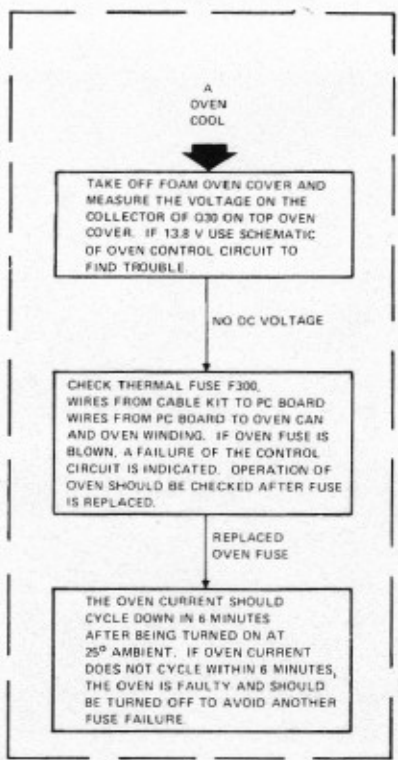
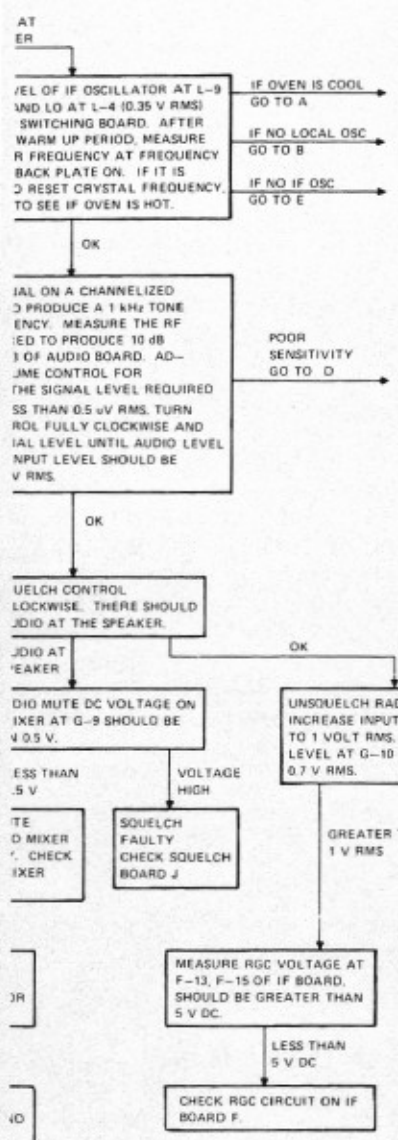


Figure 8. Receiver, Troubleshooting Chart

D-1



A-2

NO 4-R VOLTAGE

REGULATED 9 VOLTS SHOULD BE 8.5 V.

8.5 V

ANT. SWITCH VOLTAGE ON T/R SWITCHING BOARD H-9 SHOULD BE GREATER THAN 10 V. IF OK, CHECK T/R SWITCHING BOARD H FOR PROBLEM.

LOW

CHECK PTT CIRCUITRY ON MAIN BOARD.

POOR SENSITIVITY

GROUND PIN F-16 OF IF BOARD TO DEFEAT RGC CIRCUITRY. FEED SIGNAL GENERATOR AT INPUT OF RADIO AT THE FREQUENCY REQUIRED TO PRODUCE A 1 kHz TONE ON THE PROGRAMMED CHANNEL INPUT LEVEL TO 10 mV RMS.

OK

MEASURE RF AT INPUT OF FRONT END FILTER B-23. SHOULD BE APPROX. 10 mV RMS.

OK

MEASURE RF AT OUTPUT OF FRONT END FILTER B-10. SHOULD BE APPROX. 8 mV RMS.

LOW

WITH OHMMETER, CHECK DC CONTINUITY BETWEEN THE ANTENNA INPUT AND INPUT TO FRONT END FILTER B-23. SHOULD BE ZERO OHMS. THERE SHOULD BE NO DC CONTINUITY BETWEEN B-23 AND GROUND.

PROPER CONTINUITY

IMPROPER CONTINUITY

CHECK IF PROPER MODE IS SELECTED ON PROGRAMMING CARD. VOLTAGE WILL BE LESS THAN 1.5 V DC IF PROPERLY PROGRAMMED CIRCLED NUMBER ON MAIN BOARD CORRESPONDS TO RANGE.

- | | |
|---|---------------|
| 1 | 2.0-3.3 MHz |
| 2 | 3.3-5.45 MHz |
| 3 | 5.45-9.0 MHz |
| 4 | 9.0-12.3 MHz |
| 5 | 12.3-18.0 MHz |

CHECK HARMONIC FILTER

PULL OUT 1ST MIXER CARD AND MEASURE B10. IF VOLTAGE IS STILL LOW SOMETHING IS WRONG WITH FRONT END FILTER. IF VOLTAGE IS 8 V RMS THE 1ST MIXER IS LOADING THIS POINT TOO MUCH.

LOW

OK

MEASURE RF AT OUTPUT OF FIRST MIXER D-19. SHOULD BE APPROX. 65 mV RMS.

LOW

IF LOW FAULT IS IN FIRST MIXER

MEASURE RF AT OUTPUT OF CASCODE AMPLIFIER ON CRYSTAL FILTER BOARD E-5. SHOULD BE 200 mV RMS.

LOW

IF LOW CHECK CRYSTAL FILTER SCHEMATIC AND DETERMINE IF PROBLEM IS ON CRYSTAL FILTER BOARD OR FIRST MIXER.

CHECK DC CONTINUITY BETWEEN THE ANTENNA INPUT OF THE RADIO AND THE ANTENNA INPUT OF THE HARMONIC FILTER, BETWEEN THE ANTENNA INPUT OF THE HARMONIC FILTER AND THE RECEIVER OUTPUT, AND BETWEEN THE RECEIVER OUTPUT AND THE FRONT END FILTER INPUT TO ISOLATE PROBLEM AREA.

DECREASE SIGNAL GENERATOR OUTPUT LEVEL TO 5 uV. RF AT OUTPUT OF IF BOARD F-18. SHOULD BE 0.6 mV RMS.

OK

AC VOLTAGE AT UNMUTED AUDIO POINT SECOND MIXER G-10 SHOULD BE 0.37 V RMS.

OK

AC VOLTAGE AT MUTED AUDIO POINT G-6 ON SECOND MIXER SHOULD BE 0.34 V RMS. IF NO VOLTAGE AUDIO ATTENUATION COULD BE FAULTY.

OK

ENABLE RGC BY DISCONNECTING GROUND JUMPER FROM PIN F-16 ON IF BOARD. INCREASE RF SIGNAL LEVEL TO 1 V RMS. MEASURE UNMUTED AUDIO AT FIRST MIXER G-10. SHOULD BE 0.7 V RMS.

OK

ADJUST VOLUME CONTROL UNTIL 3 mV RMS AUDIO LEVEL IS AT THE INPUT OF THE AUDIO AMPLIFIER (A-14). AUDIO AT PRIMARY OF AUDIO TRANSFORMER SHOULD BE APPROXIMATELY 1.0 V RMS AT A-3.

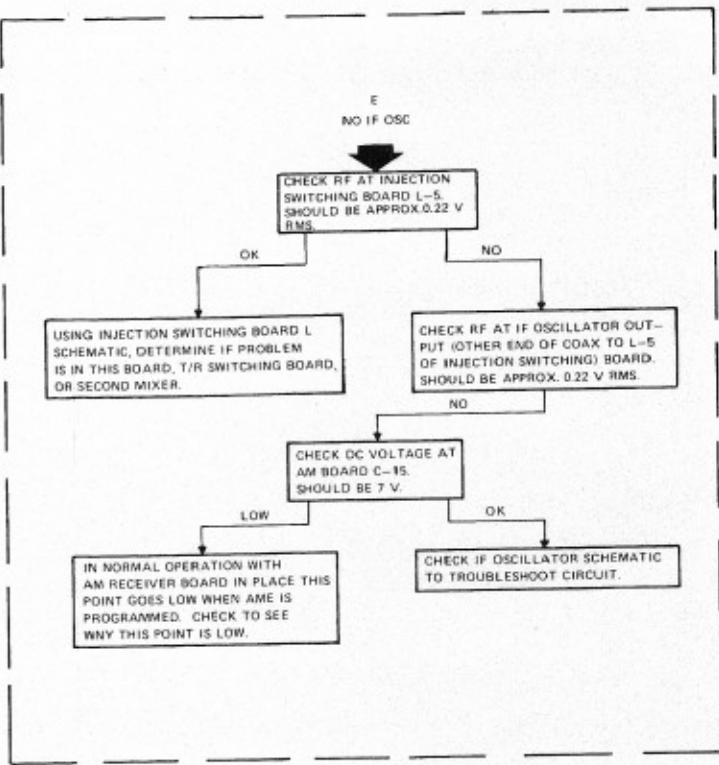
NO AUDIO AT A-14

AUDIO PRESENT AT A-14 BUT NOT AT A-3

TRACE SIGNAL FROM G-6 TO 45 PIN CONNECTOR, FROM 45-PIN CONNECTOR TO A-14 TO DETERMINE WHERE SIGNAL IS LOST

FAULTY AUDIO BOARD A OR SHORT AT SPEAKER.

D-3



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P-4

BOARD

EMATIC

RT

CHECK RECEIVER HALF POWER & TO dB SINAD SENSITIVITY. IF POOR SENSITIVITY, USE RECEIVER TROUBLESHOOTING CHART TO ISOLATE PROBLEM.

CONNECT A WATTMETER AND 50-OHM LOAD TO ANTENNA JACK. APPLY A 1 kHz, 100 mV RMS AUDIO OSC SIGNAL TO THE MIC INPUT CONNECTOR. KEY TRANSMITTER. MONITOR POWER OUTPUT. SEE NOTE 2.

POWER OUT OK

NO POWER OUT

MEASURE PA INHIBIT VOLTAGE H-7 ON T/R SWITCHING BOARD VOLTAGE SHOULD BE LESS THAN 1 V.

OK

GREATER THAN 1 V

PA DISABLE VOLTAGE H-8 SHOULD BE GREATER THAN 0.5 V. IF NOT, CHECK FOR A SHORT FROM PA DISABLE LINE TO GROUND.

OK

PTT/ANTENNA SWITCH VOLTAGE (H-9) SHOULD BE LESS THAN 0.5 V DC. IF HIGH CHECK PTT CIRCUITRY ON MAIN BOARD.

OK

9T ON PIN H-4 SHOULD BE 8.5 V AND 9R ON PIN H-5 SHOULD BE LESS THAN 0.5 V. IF NOT TROUBLESHOOT T/R SWITCHING BOARD.

MEASURE RF AT FIRST MIXER OUTPUT N-4 (0.22 V) RMS AND SECOND MIXER OUTPUT N-9 (0.35 V) RMS ON INJECTION SWITCHING BOARD. IF NO OUTPUT, CHECK INJECTION SWITCH BOARD N.

OK

CHECK RF AT OUTPUT OF FIRST MIXER D-19. SHOULD BE 0.35 V RMS!

LOW

IF OUTPUT IS LOW, CHECK FIRST MIXER BOARD D.

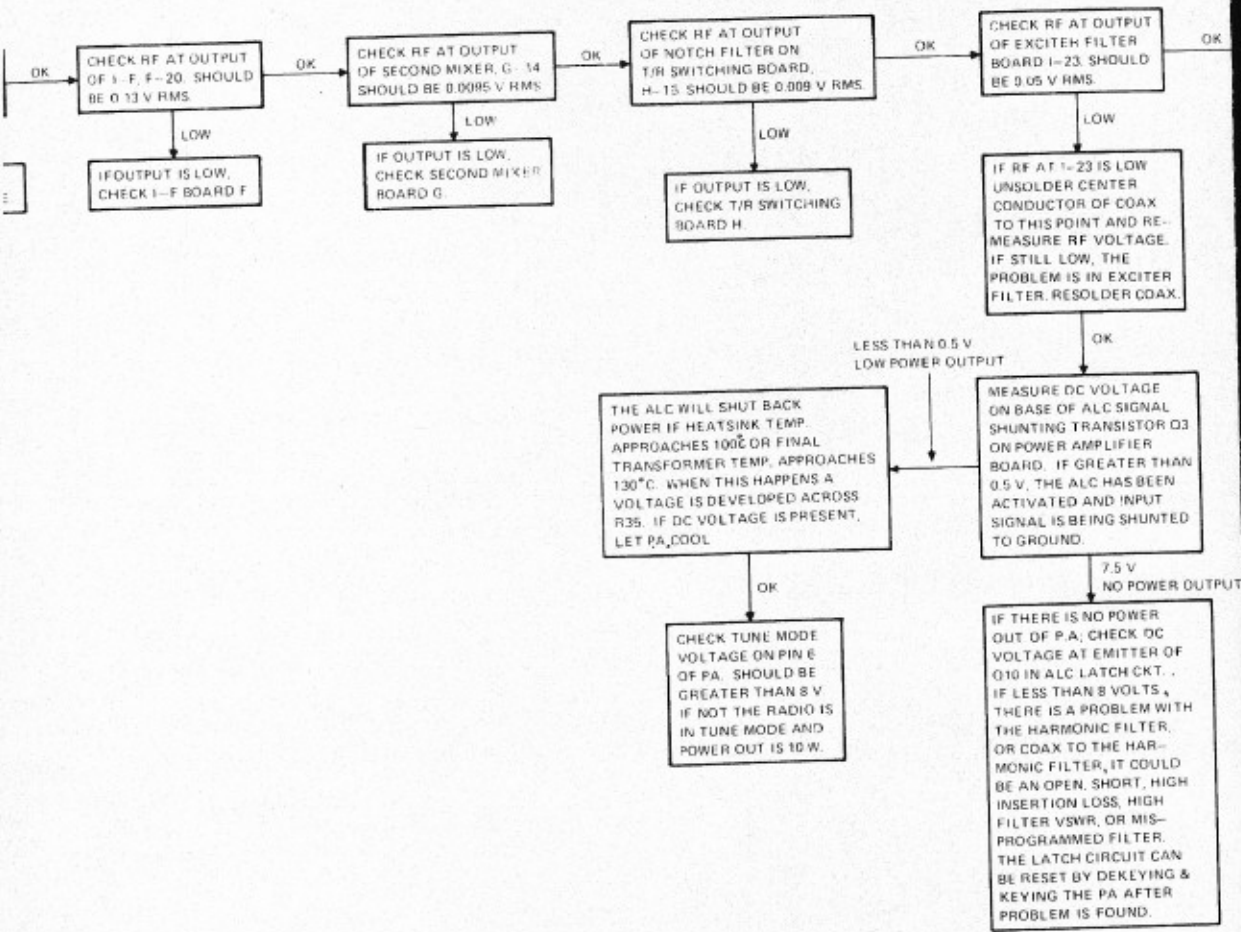
OK

CHECK RF AT OUTPUT OF CASCODE AMP, E-1. SHOULD BE 1.15 V RMS!

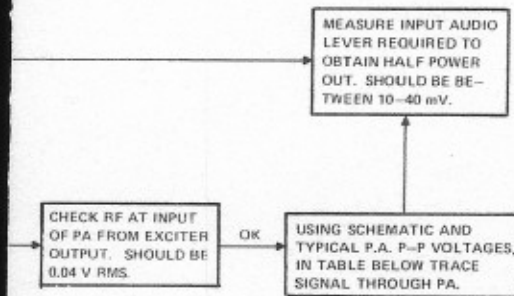
LOW

IF OUTPUT IS LOW, CHECK CRYSTAL FILTER BOARD.

C-1



C-2



NOTES:

1. POWER AMPLIFIER WILL GET HOT AND SHUT BACK POWER IF RUN CONTINUOUSLY. KEY PA ONLY WHEN NECESSARY IN ORDER TO MAKE MEASUREMENTS.

TYPICAL PA P-P VOLTAGES

	2 MHz		6 MHz		12.3 MHz		18 MHz	
	60 W	120 W	60 W	120 W	60 W	120 W	60 W	120 W
PREDRIVER Q4 COLLECTOR	23	2.8	2.4	3.9	5.33	6.2	6	17
DRIVER Q5 BASE	0.7	0.85	1.1	1.9	1.3	3.1	2.7	3
DRIVER Q5 COLLECTOR	9	9	10	9.5	15	16.5	20	26
FINALS Q8,Q9 BASES	2.6	2.2	3.4	3.6	4.2	3.7	4	3.6
FINALS Q8,Q9 COLLECTORS	19	25	19	31	24	34	22	38

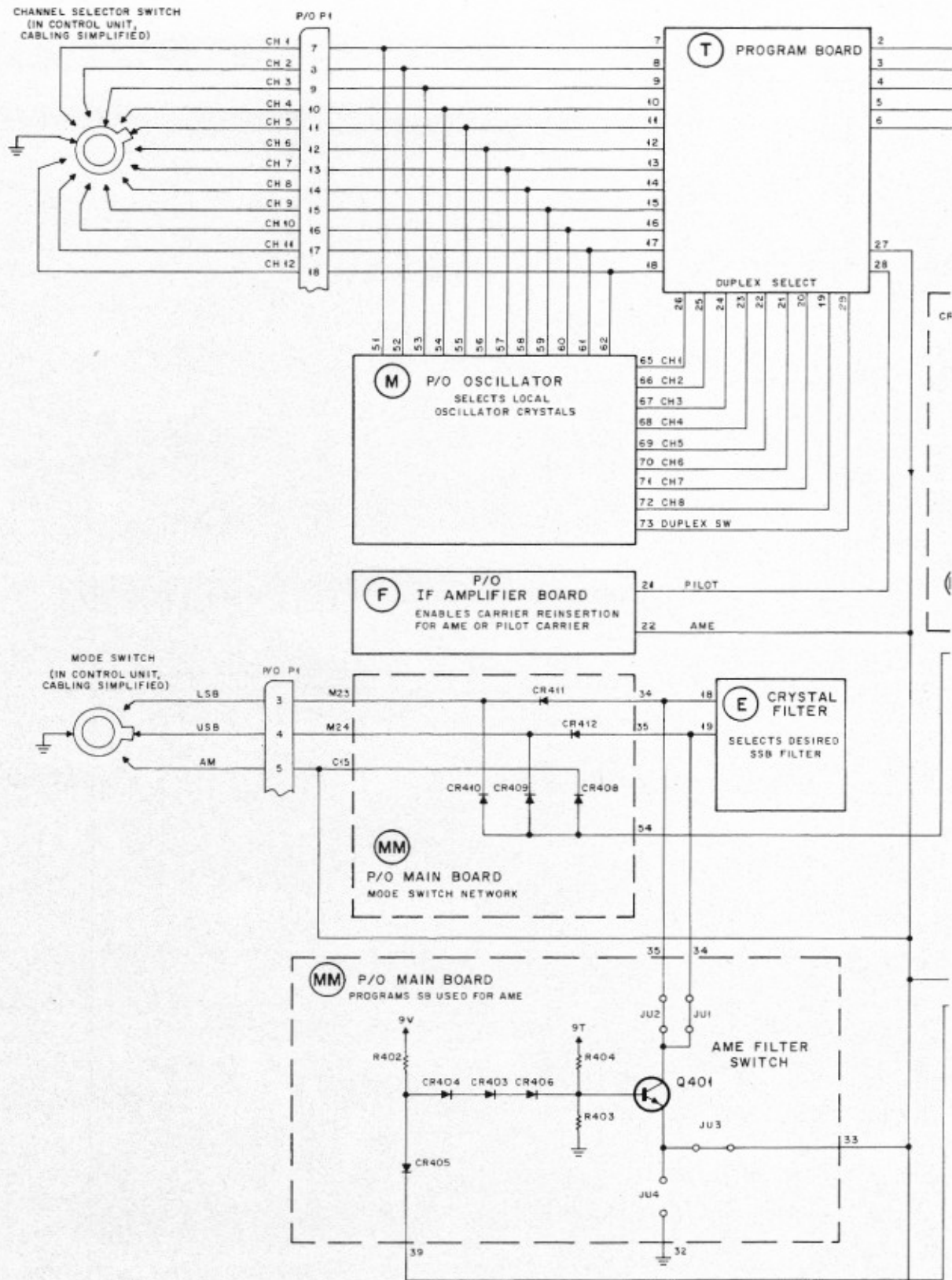
2. APPLY AUDIO SIGNAL AT POINT SPECIFIED BELOW (USE 25 μ F BLOCKING CAPACITOR) AND KEY TRANSMITTER BY GROUNDING POINT INDICATED.

MODEL	APPLY AUDIO AT	KEY XMTR AT
MOBILE	PIN 3 OF MIC CONNECTOR	PIN 1 OF MIC CONNECTOR
CONSOLETTTE	TB1-8 (HI), TB1-7	TB1-9 (TO TB1-7)
COMPA	A7 & A8 LO	A9 (TO A4)
RTTY	A7 & A8	A9 (TO A4)

EEPS-19695-0

C-3

Figure 7. Transmitter, Troubleshooting Chart



NOTES:

1. CABLING TO CIRCUITS IN CONTROL UNIT, LINEAR AMPLIFIER, AND ANTENNA TUNER SHOWN SIMPLIFIED.

2. JUMPER USAGE

USB TRANSMIT IN AME	JU1	JU2
LSB TRANSMIT IN AME	IN	OUT
	OUT	IN

THE FOLLOWING JUMPERS ARE INSERTED IN THE STANDARD RADIO:

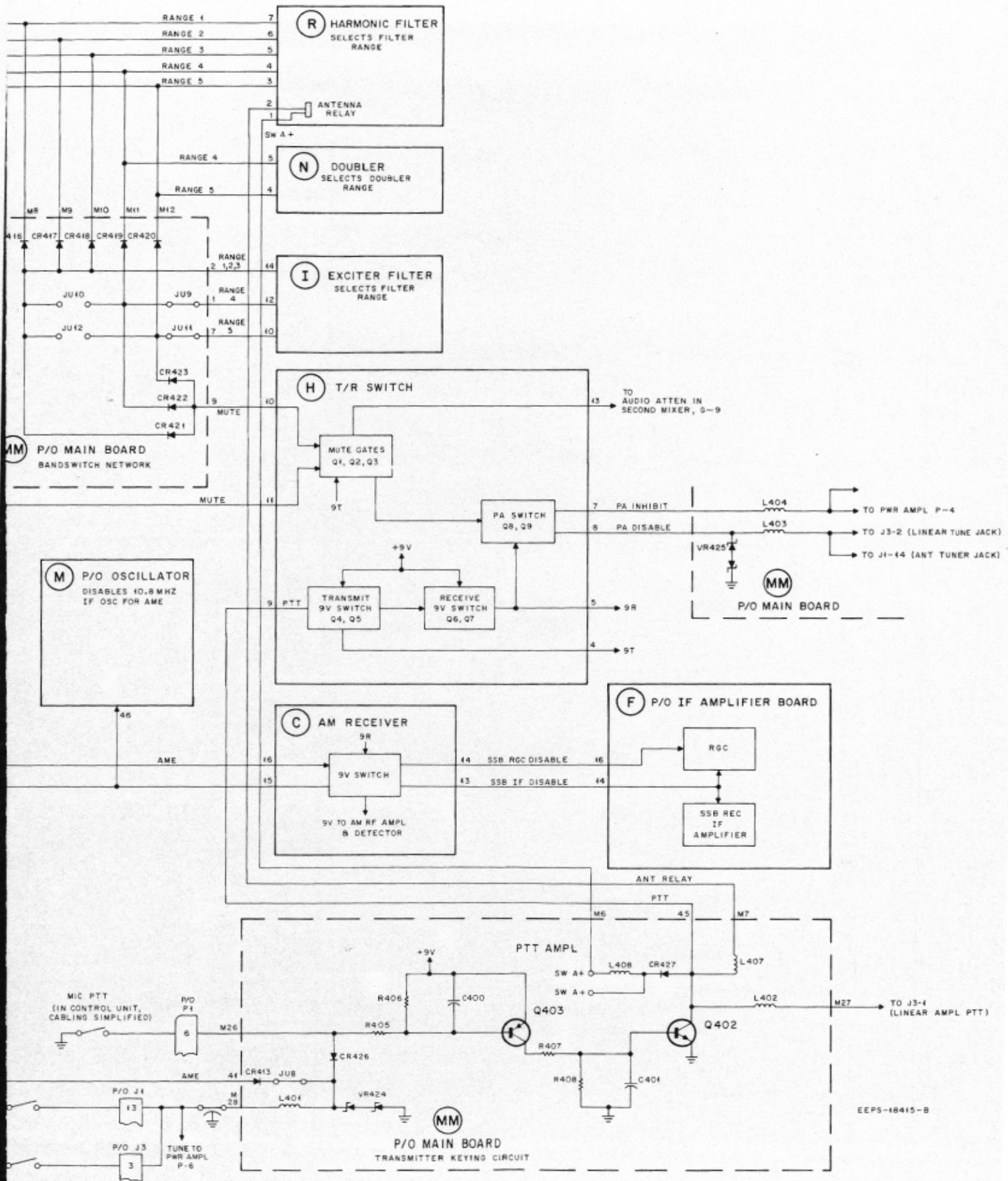
JU3, JU8, JU9, JU11

FROM J1-J3 ANTENNA TUNER TUNE SWITCH (CKT SIMPLIFIED)

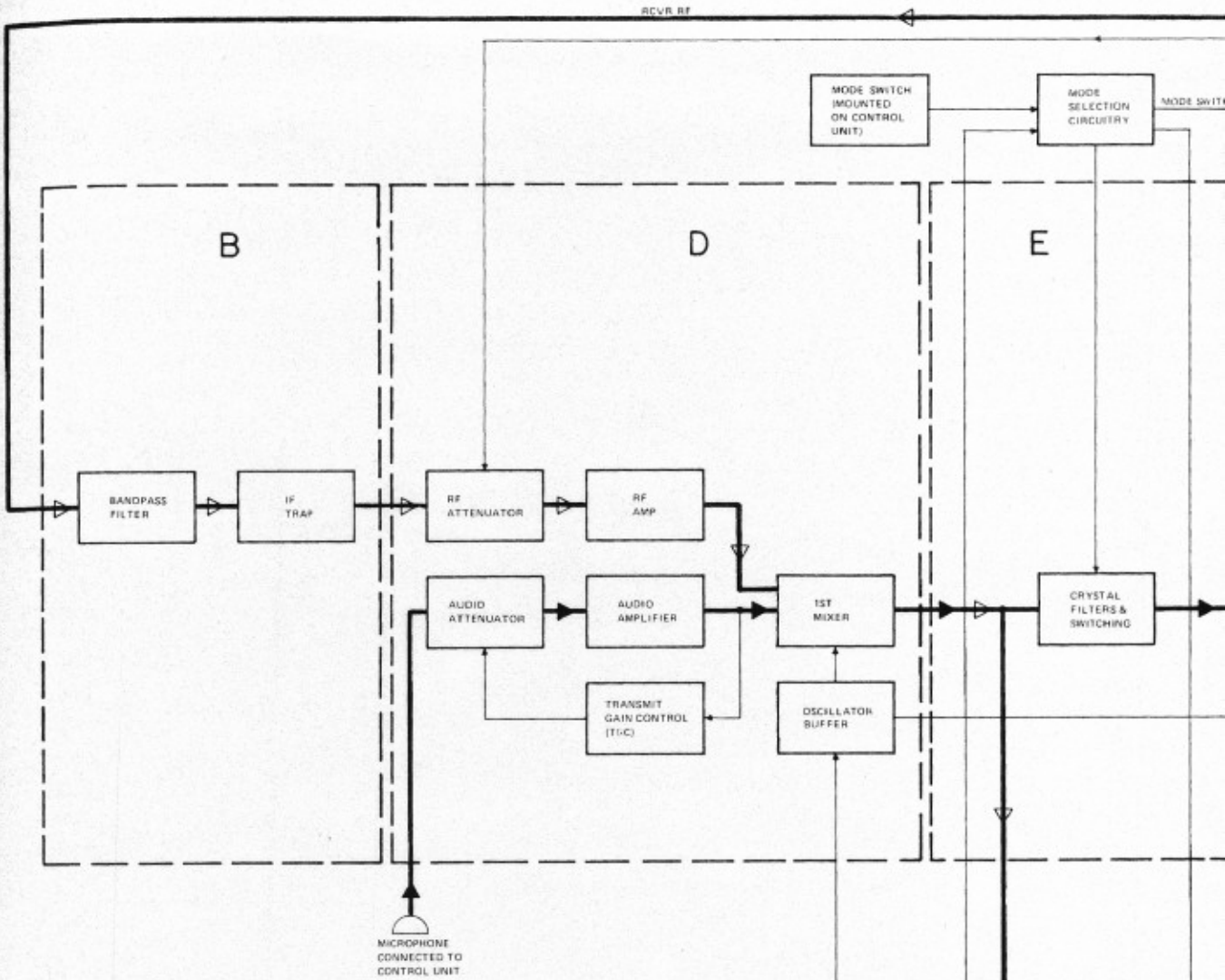
LINEAR AMPLIFIER TUNE SWITCH (CKT SIMPLIFIED)

Figure 2.
Audio and Control Circuits,
Simplified Schematic Diagram

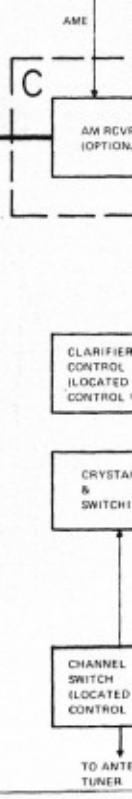
B-1



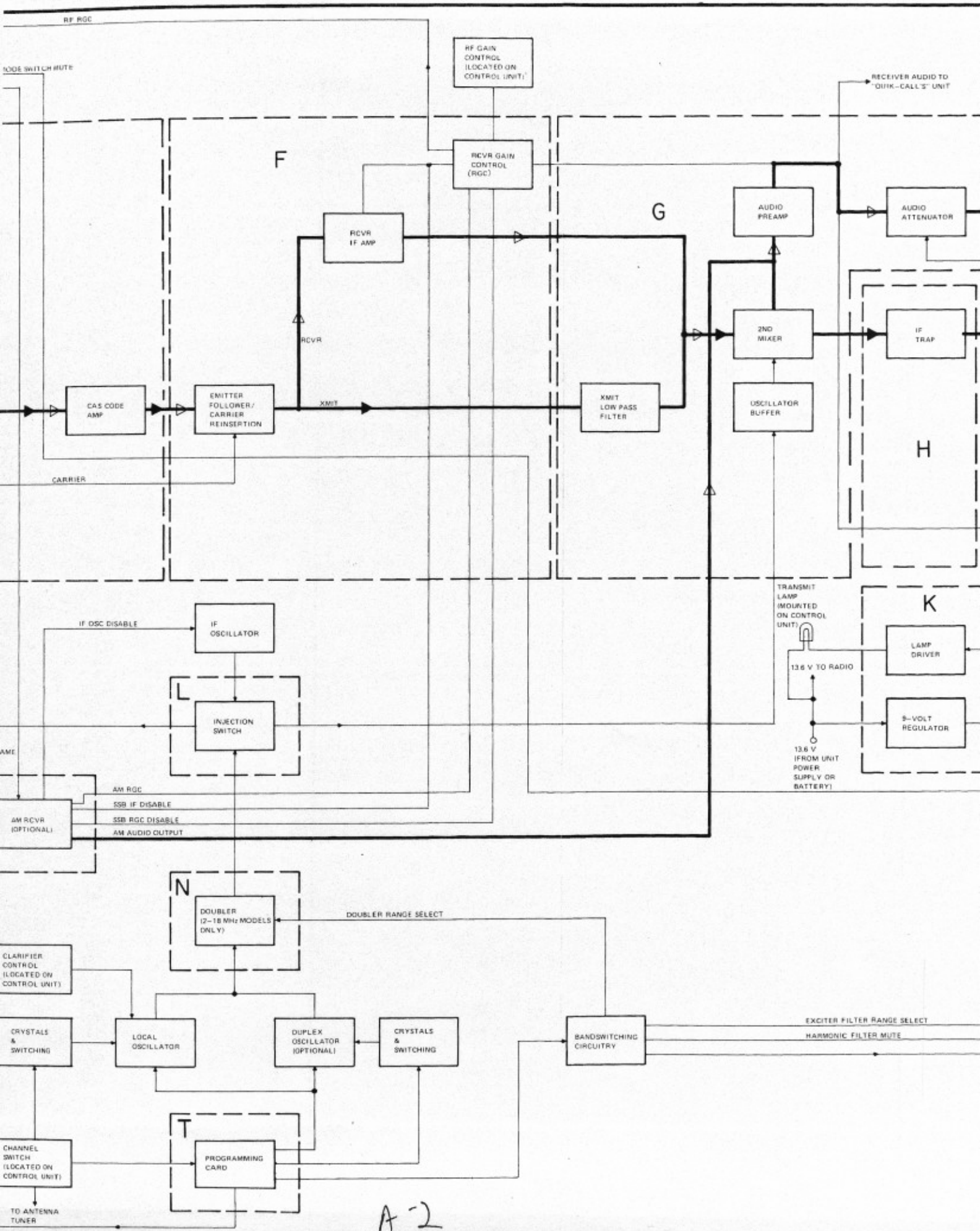
B-2



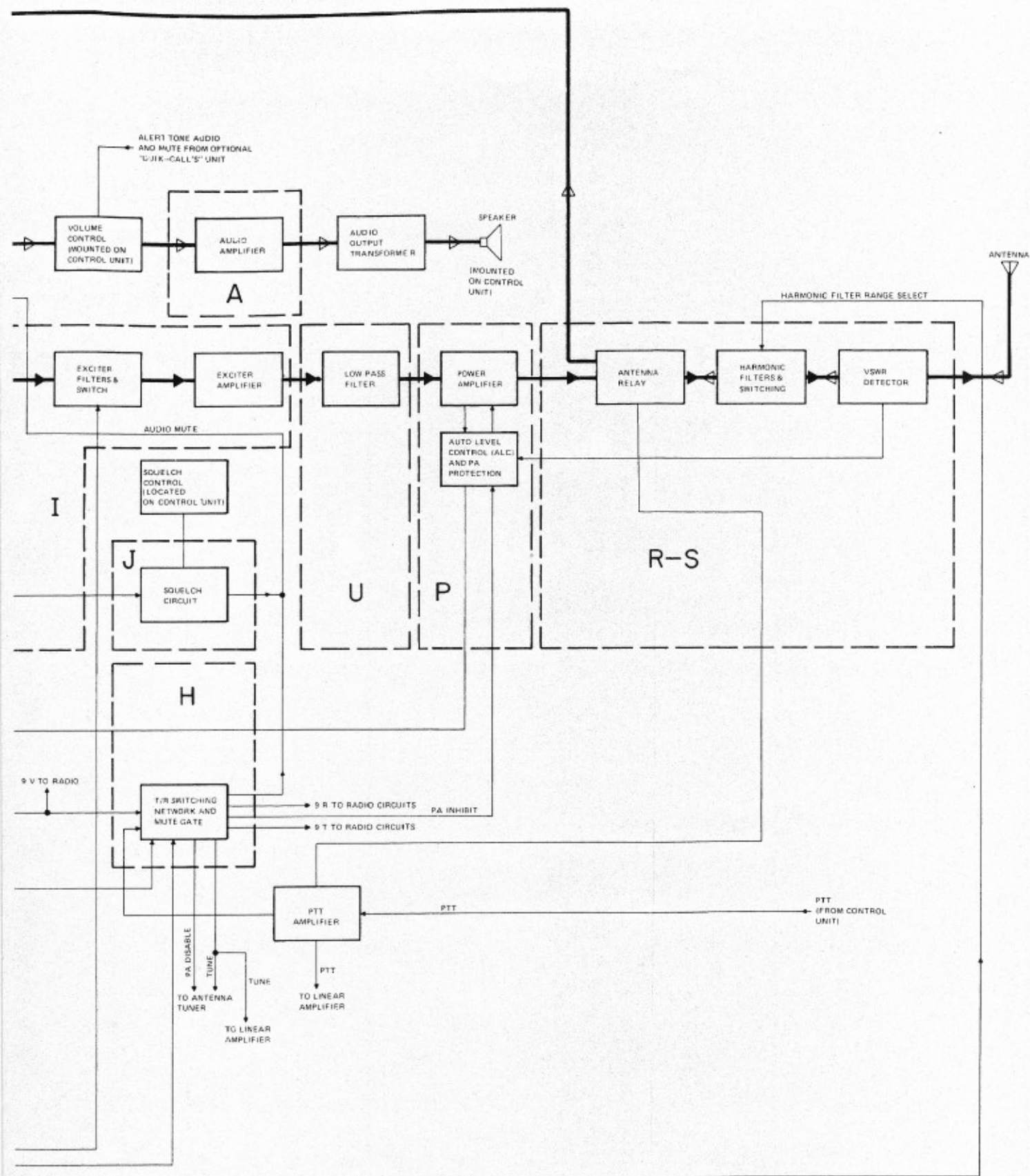
- LEGEND:
- RECEIVE SIGNAL PATH
- TRANSMIT SIGNAL PATH
- A - AUDIO AMPLIFIER
- B - FRONT END FILTER
- C - AM RECEIVER
- D - FIRST MIXER
- E - CRYSTAL FILTER
- F - IF AMPLIFIER
- G - SECOND MIXER
- H - TRANSMIT/RECEIVE SWITCH
- I - EXCITER FILTER
- J - SQUELCH
- K - 9 VOLT REGULATOR
- L - INJECTION SWITCHING
- M - MAIN BOARD (BLOCKS NOT ENCLOSED BY DASHED LINES)
- N - DOUBLER
- P - POWER AMPLIFIER
- R - HARMONIC FILTER (2-9 MHz)
- S - HARMONIC FILTER (2-18 MHz)
- T - PROGRAM BOARD
- U - FINAL FILTER



A-1



A-2



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Figure 1.
Radio Set, Block Diagram

A-3