

# INSTRUCTION MANUAL

for

**MODEL AM-60P**

**L P B** <sup>®</sup>  
AM BROADCAST TRANSMITTER

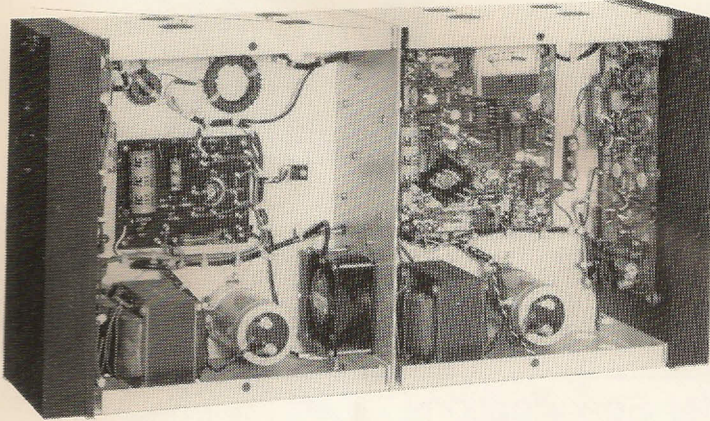
**PSSA / PSRA**

**LOW POWER**

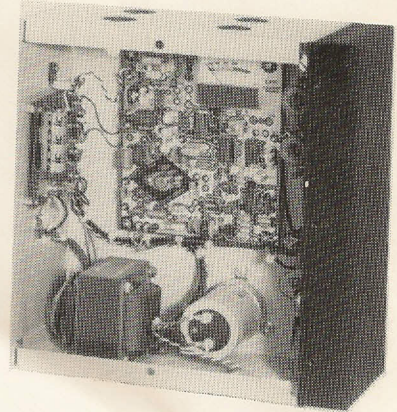
**AUTHORIZATION**

# LPB<sup>®</sup>

## *AM Broadcast Transmitters*



*AM-60P*



*AM-30P*

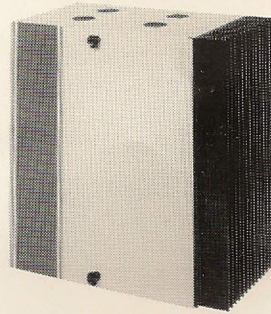
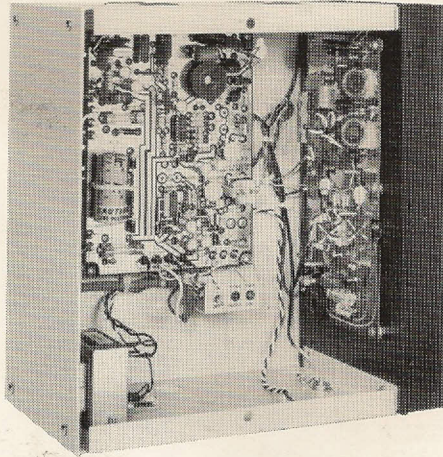
Since 1960, LPB has been the internationally recognized leader in low power AM broadcasting. LPB uses the very latest RF technology to provide the most rugged and economical transmitter for low power commercial applications, travelers' information and carrier current systems.

LPB transmitters are completely solid-state. The crystal oscillator operates at six times the carrier frequency with digital countdown circuitry. A high-stability oscillator circuit is used for FCC Part 73 applications. A modular design using a pair of balanced emitter output transistors provide up to 30 watts of RF power that can withstand any output mismatch or short circuit condition. The 60 watt transmitter uses two 30 watt modules with dual power supplies and an RF power combiner. A computer designed elliptic function output filter provides the highest degree of RF harmonic suppression.

The AM-30 and AM-60 series transmitters use an internal meter to monitor modulation level and RF power output. Modulation level on the AM-5 is indicated by a quick response LED peak flasher set to illuminate at 100% peak modulation. This indicates true peak modulation of the transmitter and provides a means of maintaining maximum undistorted modulation of the signal. RF power on the AM-5 is monitored by a second LED that also serves as a "power on" indicator. RF output power is continuously variable on all transmitters so that a precise setting can be chosen by the user.

All LPB low power transmitters are designed for universal application including AM stereo. With a 50 ohm unbalanced RF output, any transmitter can readily interface with direct radiating systems using impedance matched radiators. The companion TCU-30 Transmitter Coupling Unit is used for carrier current installations and other applications utilizing non-standard radiating elements.

# AM Broadcast Transmitters



AM-5

## Transmitter Specifications

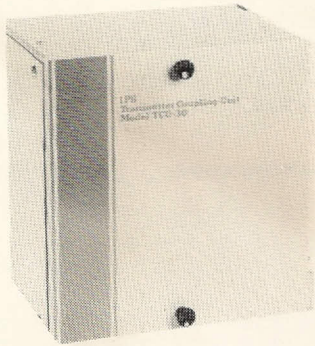
R.F. Power Output	Adjustable, 1 to 5 Watts (carrier)
AM-5	Adjustable, 2 to 30 Watts (carrier)
AM-30	Adjustable, 6 to 60 Watts (carrier)
AM-60	Internal
R.F. Power Adjustment	Internal
R.F. Power Indicator	
AM-5	Green LED
AM-30, AM-60	Internal Meter
Type of Emission	30A3 (Amplitude Modulation)
Frequency Range	530 kHz to 1610 kHz
R.F. Output Impedance	50 ohms, unbalanced SO-239 connector
Carrier Frequency Stability	$\pm .003\%$ , $-20^{\circ}\text{C}$ to $+50^{\circ}\text{C}$ 105 to 128 VAC line ( $-4^{\circ}\text{F}$ to $+122^{\circ}\text{F}$ )
R.F. Harmonic Suppression	$< 45\text{dB}$ below carrier
Carrier Shift	$< 2\%$ , 0-100% Modulation
Noise Level	$< 55\text{dB}$ below 100% modulated carrier
Audio Input Impedance	600 ohm, transformer balanced
Audio Input Level	$-15\text{dBm}$ to $+10\text{dBm}$ for 100% Modulation
Optional Limiter	Factory set to prevent more than 100% Modulation Attack Time: 3.3 ms Release Time: 330 ms
Audio Frequency Response	20 Hz to 15 kHz $\pm 1.0\text{dB}$
Audio Distortion	$< 2\%$ , 95% Modulation
Modulation Indicator	
AM-5	Red LED peak flasher
AM-30, AM-60	Internal Meter
Modulation Control	Internal Adjustment
Power Input	117VAC, 50/60 Hz
Power Consumption	
AM-5	45 Watts
AM-30	150 Watts
AM-60	250 Watts
Dimensions	
AM-5, AM-30	12"H, 6.5"D, 11.75"W
AM-60	12"H, 6.5"D, 23"W
Weights	
AM-5	12 lbs
AM-30	20 lbs
AM-60	36 lbs

**LPB**

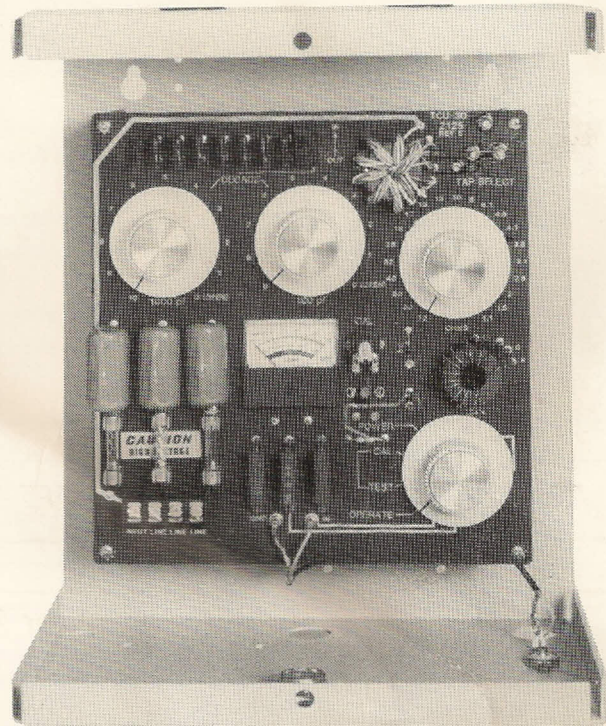
LPB Inc.

28 Bacton Hill Road, Frazer, Pa. 19355 (215) 644-1123

# MODEL TCU-30 *Transmitter Coupling Unit*



*TCU-30  
Meter  
Detail*



The LPB Model TCU-30 Transmitter Coupling Unit is required when coupling an AM transmitter into a non-impedance matched inductive radiator, such as electrical power wiring systems or other distributed wiring systems. The TCU-30 is the third generation result of over 20 years experience and product development in carrier current technology.

All functions required for optimum coupling (matching) into single or 3-phase power systems are provided by the TCU-30 including power line inductance correction, impedance selection, power line isolation and complete metering.

The TCU-30 is specifically designed to eliminate internal toroidal heating, one of the major causes of coupling unit failure that has plagued all previous designs. Other innovations include extremely broad impedance matching selection (21 steps) and a calibrated transmitter power output meter with a direct reading VSWR scale. Such metering allows accurate measurements of power and VSWR from only one watt to the rated maximum output of 30 watts.

With modular construction, any two units in this equipment series can be rack mounted. For additional flexibility, the individual units may be wall mounted in any convenient configuration.

## TCU-30 SPECIFICATIONS

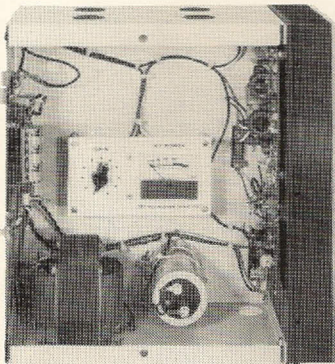
Power Input	30 watts RMS, continuous
Input Impedance	50 ohms, unbalanced
Output Impedance	0.5 ohms to 65 ohms (1:1 VSWR) 0.2 ohms to 130 ohms (2:1 VSWR)
Output Impedance Selection	21 steps
Frequency Range	530 kHz to 1610 kHz
Inductance Correction	100 pf to 10,900 pf in 109 steps
Matching Circuit	2 stage toroidal, bifilar and penta-filar wound
Input Connection	SO-239 coaxial connector
Output Connection	Screw-terminal barrier strip
AC Line Connection	
(output)	660 VAC line to line (1100 VAC optional) 380 VAC line to ground (635 VAC optional)
Metering	Transmitter power output (0-30 watts) Voltage Standing Wave Ratio (1:1 to 6:1)
Dummy Load	50 ohms, non-inductive
Controls	21 position impedance selector 2 capacitor decade selectors, capacitance decade IN-OUT, SWR calibration
	Function switch: Power, Calibrate, Test (Match), Operate
Minimum Power Input for accurate matching	1 watt
Size	12"H, 6.5"D, 11.75"W
Mounting	Wall mount or rack mount
Weight	15 lbs

# LPB

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# MODEL LA-30 *30 Watt Linear RF Amplifier*

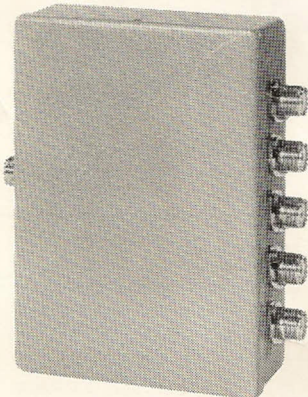


The LPB Model LA-30 Linear RF Amplifier is used as a 30 watt signal repeater to boost the RF output signal within an RF distribution system or a carrier current system in a very large building or complex of buildings.

## SPECIFICATIONS

R.F. Power Output . . . . .	Adjustable 2-25 watts	Connectors . . . . .	2 type SO-239 coaxial connectors
Frequency Range . . . . .	530 to 1610 kHz	Power Requirements . . . . .	117 VAC, 50/60 Hz, 150 watts maximum
Distortion . . . . .	Intermod 30dB down or better at 30 watts output	Weight . . . . .	15 lbs.
R.F. Input Impedance . . . . .	50 ohms resistive	Size . . . . .	12"H, 6.5"D, 11.75"W
Input Level . . . . .	0.25 watts min. 2 watts max. (3.5 to 10 vrms carrier)		

# MODEL T-1A *Power Splitter*



The LPB T-1A Power Splitter accepts an RF signal output from a low power AM transmitter and divides the output power into equal portions. This may be required to drive two or more RF distribution systems in adjacent locations.

Standard models of the T-1A are available to divide the input power into 2, 3, 4, 5 or 6 equal portions.

## SPECIFICATIONS

Input Impedance . . . . .	50 ohms, unbalanced	Insertion Loss . . . . .	3dB per output
Output Impedance . . . . .	50 ohms, unbalanced	Input/Output Connections . . . . .	Standard SO-239 coaxial connectors
Power Input . . . . .	Up to 50 watts RMS, continuous	Dimensions . . . . .	Width 6.25", Height 7.25", Depth 2"
Frequency Range . . . . .	360 kHz to 2 MHz	Weight . . . . .	Approximately 14 oz.
Outputs . . . . .	2, 3, 4, 5 or 6 (specify when ordering).		<i>Special division ratios and impedance levels available to order.</i>

# NF Series *Radiating Cable*

LPB "NF" Series Radiating Cable is a controlled radiation "leaky" coaxial cable for use in Restricted Range AM Broadcast Systems.

The NF-1D Cable is designed for use where no more than a 1,000 feet continuous linear transmission zone is required. The NF-2D cable is a lower loss, heavy duty cable, which may be used for a linear transmission zone of up to 5,000 feet.

## SPECIFICATIONS

Construction . . . . .	Coaxial, with drain wire
Dielectric . . . . .	Solid polyethylene
Jacket . . . . .	Polyvinylchloride (direct burial)
Characteristic Impedance . . . . .	50 ohms, @ 1 MHz
Dimensions . . . . .	NF-1D: 1/4" Dia., NF-2D: 7/16" Nominal, 1/2" Max. Dia.



LPB Inc.  
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**INSTRUCTION MANUAL**  
**LPB MODEL AM-60P TRANSMITTER**  
**PSSA/PSRA LOW POWER AUTHORIZATION**

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INSTALLATION MANUAL

FOR MODEL 44-218 TRAILER  
REAR LOW POWER AUTOMATIC

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# INSTRUCTION MANUAL

## LPB MODEL AM-60P TRANSMITTER

### PSSA/PSRA LOW POWER AUTHORIZATION

Revised February 15, 1990

#### 1.0 INTRODUCTION

Low Power AM Transmitters are the product of LPB's nationally recognized broadcast experience since 1960. This 'P' version solid state transmitter utilizes state-of-the-art technology and has been Type Approved for licensed use under PART 73 of the FCC Rules and Regulations.

The transmitter power output (TPO) of 60 watts is adjustable down to about 10 watts. Two RF power amplifiers are driven by the standard "P" version exciter. Their outputs are then combined via a conventional toroidal power combiner. A Tri-Power option is available for remote power reduction. This option is described later in this manual.

#### 2.0 WARRANTY AND SERVICE INFORMATION

##### 2.1 Limited Warranty

We guarantee that you will find the appearance, workmanship and standards of material and construction of this equipment in keeping with the application and with good standards of commercial practice.

For a period of one year from date of delivery, we guarantee this equipment against any form of failure provided that, in the opinion of the manufacturer, no improper use of or modification to this equipment is at fault. The guarantee also requires that the equipment is properly installed and operated within stated parameters. During this period, LPB will furnish materials and labor in our shops to correct any failure. Shipping charges are the responsibility of the customer.

After warranty expiration, service will continue to be available from LPB.

##### 2.2 SERVICE

This equipment is designed and constructed for optimum results and minimum failure. If any problem or question should arise, please call or write LPB Customer Service immediately. Identification information which you should provide



when calling or writing includes: model number, serial number, operating frequency and date of purchase. This information is found on the identification label on the transmitter.

This equipment, in general, **IS NOT USER SERVICEABLE**. If a malfunction arises or is suspected, we urge you to return the equipment to the factory for proper repair.

If the need for service arises contact LPB's Customer Service Department for a **Material Return Authorization (MRA)** and shipping instructions before shipment. The MRA number must be on the shipping label.

LPB, Inc. Phone 215-644-1123

FAX 215-644-8651

### 3.0 APPLICABLE FCC RULE

#### 3.1 FCC Metering Requirements

In paragraph 10 of *Report and Order in the matter of MM Docket 85-125*, adopted December 20, 1985, the Commission amended Part 73.58 to read as follows:

"However, auxiliary transmitters with nominal power ratings of 100 watts or less are not required to be equipped with instruments to determine power by the indirect method provided that the licensee can determine the antenna input power at all times."

The Relative Power Output meter in the LPB AM-60P transmitter does not satisfy this metering requirement. We suggest the licensee employ an Antenna Current Meter, such as the Simpson model 37 (3-1/2") RF Ammeter. When looking into a 50 ohm load, the 60-watt transmitter needs a 0 - 1.5 A. full-scale ammeter.

It should be noted that the Commission does not require this RF ammeter meter to be in the circuit at all times, however, you must have and use this capability to measure the output.

#### 3.2 Advising the FCC

When installing a transmitter for use with low power authorization, the user must advise the Commission, **in writing**, of this action. The make and model number of the transmitter must be submitted.

# AM-60P TRANSMITTER BLOCK DIAGRAM

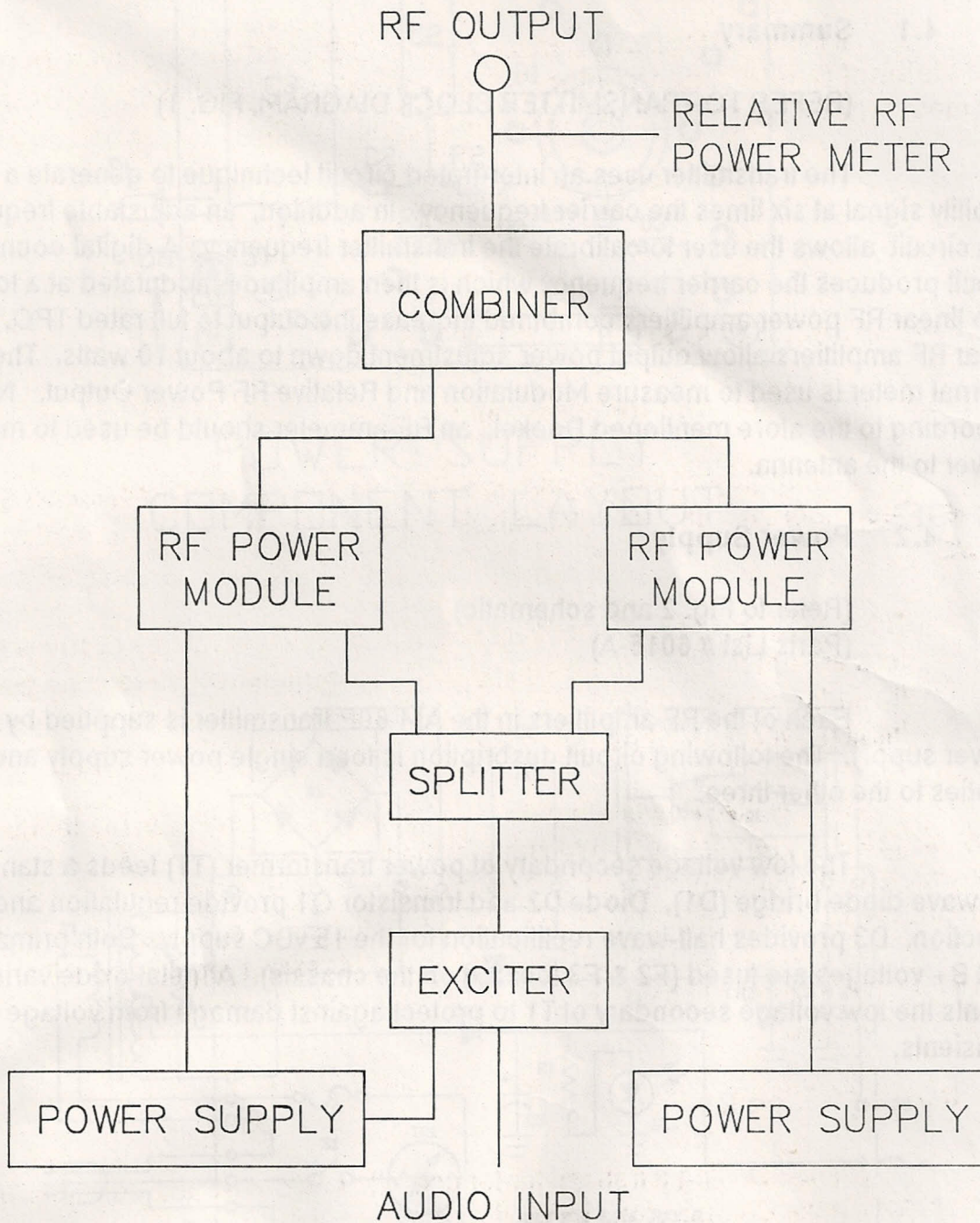


FIGURE #1

### 4.3 Exciter ('P' version)

(Refer to Fig. 3 and schematic)  
(Parts List # 6094-F and # 6010-F)

#### 4.3.1 Audio

The audio section utilizes input transformer T2 to provide isolation and balanced 600 ohm line input. The transformer secondary drives an operational amplifier A1 in the inverting mode. This feeds an integrated circuit balanced modulator A4 and the input of the meter amplifier A6. The meter is calibrated to indicate 0 VU at 100% modulation with a tone input (1 kHz standard) connected to the transmitter audio input.

Balanced modulation A4 provides a low level amplitude modulated signal. This output is square wave, rich in harmonics. DC voltage for the audio input stage, meter amplifier and modulator is provided from a sub-regulated power supply for high stability.

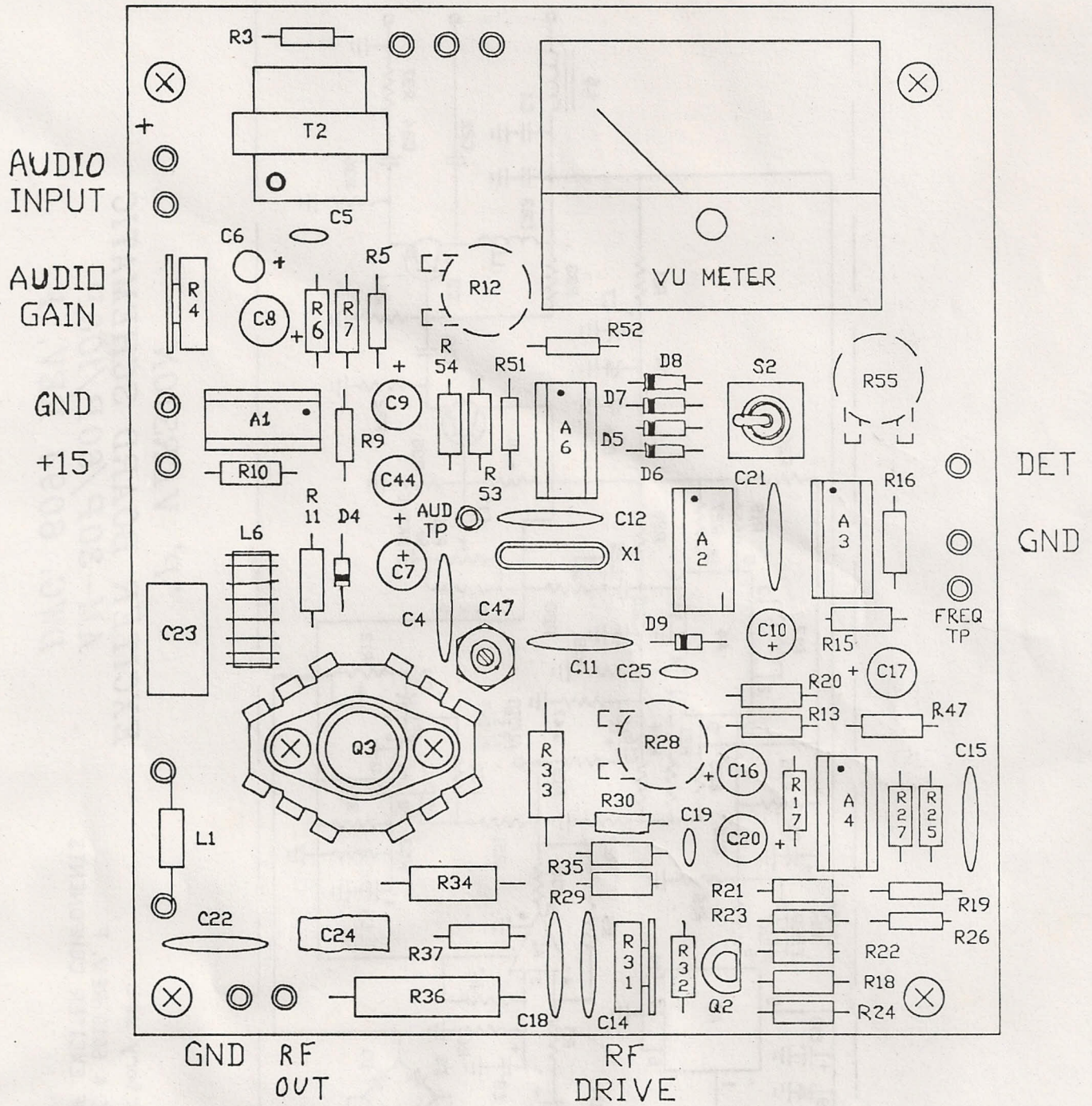
#### 4.3.2 Oscillator

A precision crystal is used in the integrated circuit oscillator A2. It operates at six times the transmitter carrier frequency for maximum stability. A variable capacitor, in series with the crystal, enables adjustment of the oscillator frequency. This trim circuit will ensure accuracy at the fundamental frequency. The oscillator output drives a divide-by-six counter A3. This output is square wave at the carrier frequency and is applied to the modulator A4.

#### 4.3.3 RF Pre-Driver and Driver Stages

Modulator A4 output drives the pre-driver amplifier consisting of an emitter follower Q2 which drives the power transistor Q3 operating Class A. The RF drive level control R31 in the pre-driver adjusts the output power of the transmitter. The driver amplifier provides input to the final power amplifiers.

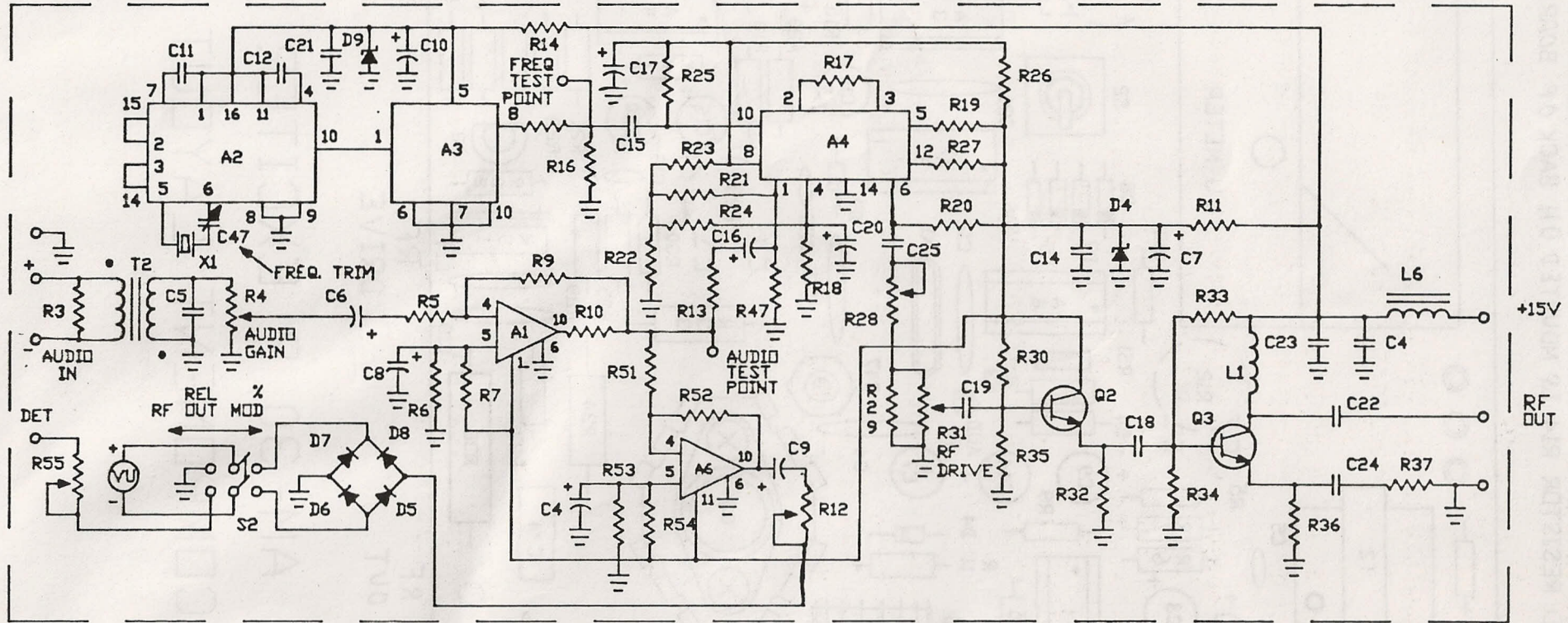
NOTE: RESISTOR R14 IS MOUNTED ON BACK OF BOARD.



AM-30 P EXCITER  
COMPONENT LAYOUT

FIG. 3

Part 4 B



NOTES:

1. R12, R28, R55 are factory set.
2. REFER TO PARTS LIST # 6010 REV. F FOR COMPLETE LIST OF EXCITER COMPONENTS

'P' VERSION  
 EXCITER BOARD SCHEMATIC  
 AM-30P/60P/100P  
 DWG. 6094 REV. F

#### 4.4 RF Power Amplifier

(Refer to RF Power Amplifier Fig. 4 and schematic)  
(Parts List # 6005-A)

Note: Refer to Parts List # 6152-A for R38, R44, R45, R46, C36 and D11 component values and part numbers.

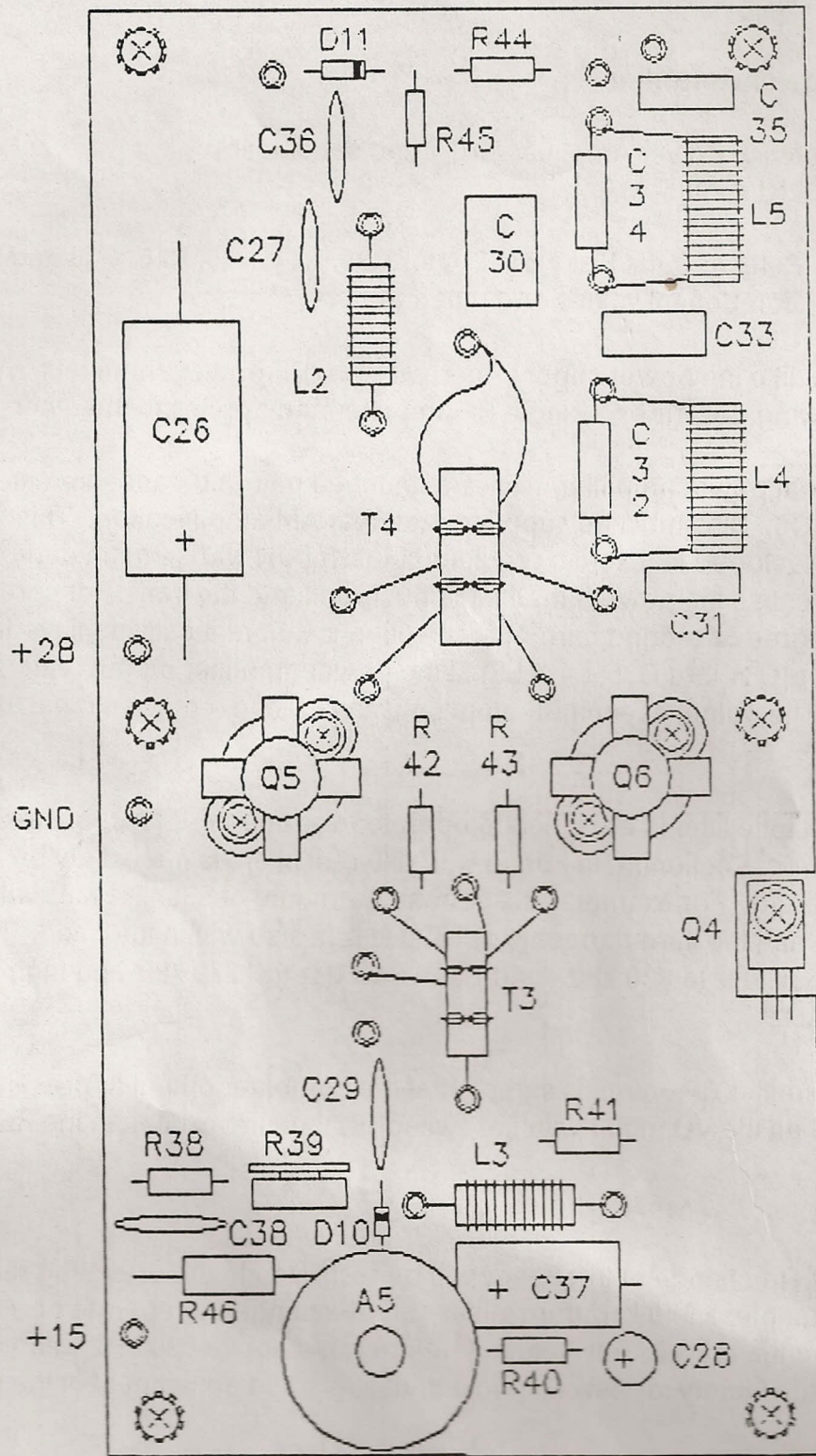
Again, like the power supply, there are two RF power amplifiers in the AM-60P. The following describes a single RF amplifier and applies to the others:

The final power amplifier utilizes a matched pair of balanced emitter transistors Q5 and Q6. Bias must be supplied for linear AM amplification. This operating bias is developed in a series regulated bias supply whose main components are A5 and Q4. Because the power amplifier is push-pull and the transistors are matched, a high degree of second harmonic rejection is automatically achieved. An elliptic function filter (C31 thru C35, L4 & L5) at the power amplifier output rejects higher order harmonics. The output of each RF amplifier is then fed to a conventional toroidal power combiner.

The elliptic filter is designed to operate over one-third (1/3) of the 530 kHz to 1610 kHz AM band. Sectioning the band with different filters is necessary because of the width of the band. For example: the second harmonic of 530 kHz falls within the band at 1060 kHz, and the third harmonic at 1590 kHz is also within the band. The low-band filter covers 530 kHz to 830 kHz, mid-band 840 kHz to 1270 kHz and high-band 1280 kHz to 1610 kHz.

Transmitter RF output is sampled at the combiner output to present Relative RF Output on the VU meter with the switch (SZ), on the exciter, in the REL RF OUT position.

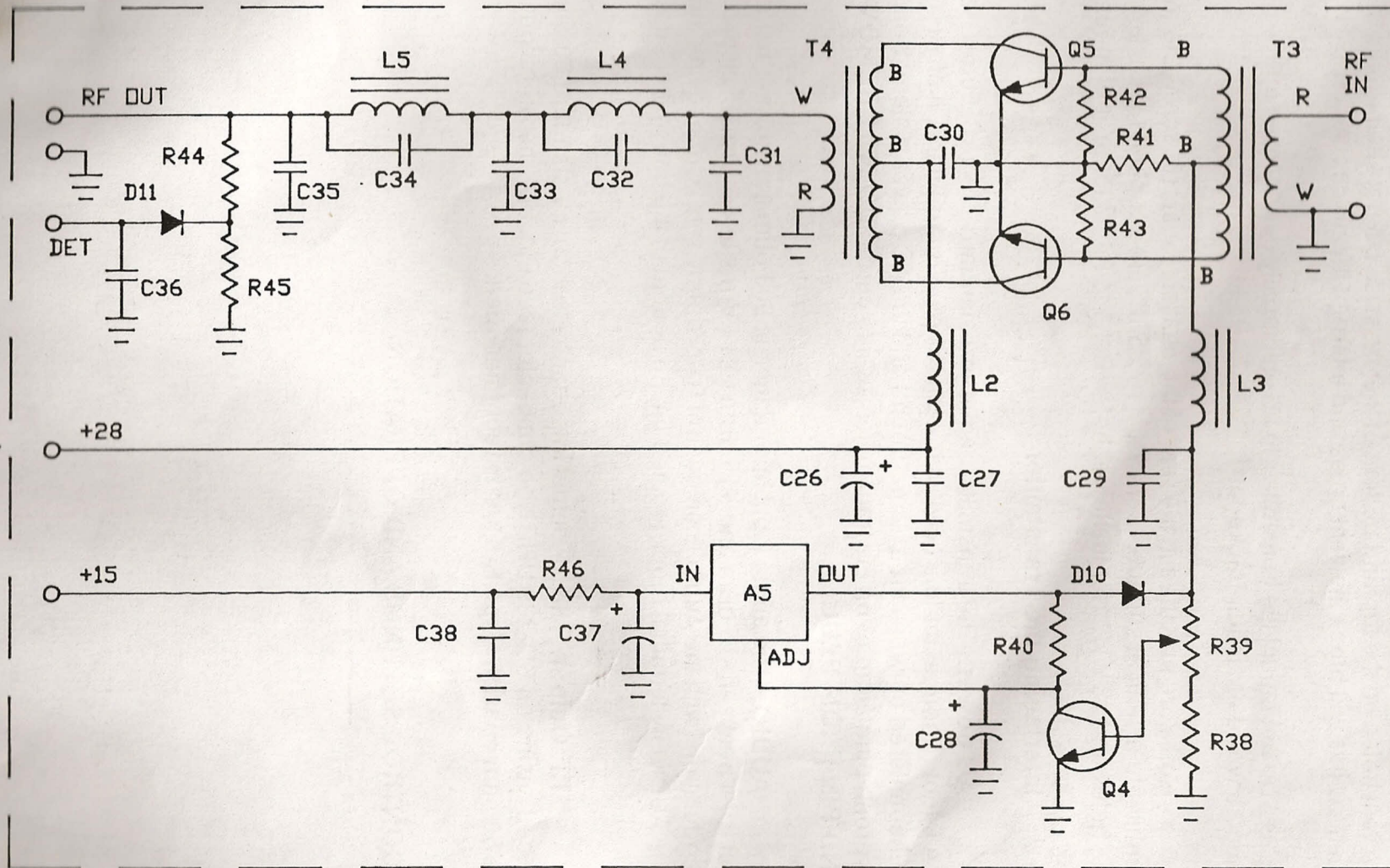
Any field change of frequency will be restricted to the operating range of the filters. For example: a 640 kHz transmitter can be changed to operate on 710 kHz by simply changing the crystal, but it cannot be operated above 830 kHz without first being returned to the factory for new elliptic output filters and adjustment of the power amplifiers.



RF POWER AMP  
 COMPONENT LAYOUT

PAGE 5 A

FIG. 4



AM-30P/60P/100P  
 RF POWER AMP MODULE RFA-30 SCHEMATIC  
 Dwg. No. 6006 REV. A

PHOTO  
 S B



## 5.0 INSTALLATION

### 5.1 Location and Mounting

Select a location which will provide several inches of clearance on all sides of the transmitter. Clearance around the heatsinks is especially important. Do not block the vent holes on the top and bottom of the chassis. Do not shelf-mount the transmitter, as this will block the vent holes and interrupt the air circulation.

Do not mount the transmitter to an electrically conductive surface. We recommend a wood or similar backboard.

Holes are provided in the rear of the chassis for six (6) screws to mount the transmitter to a vertical surface. Screws, #10 x 5/8", are supplied for the key type mounting holes and #8 x 1/2" for the lower hole. Refer to Fig. 7 for proper mounting.

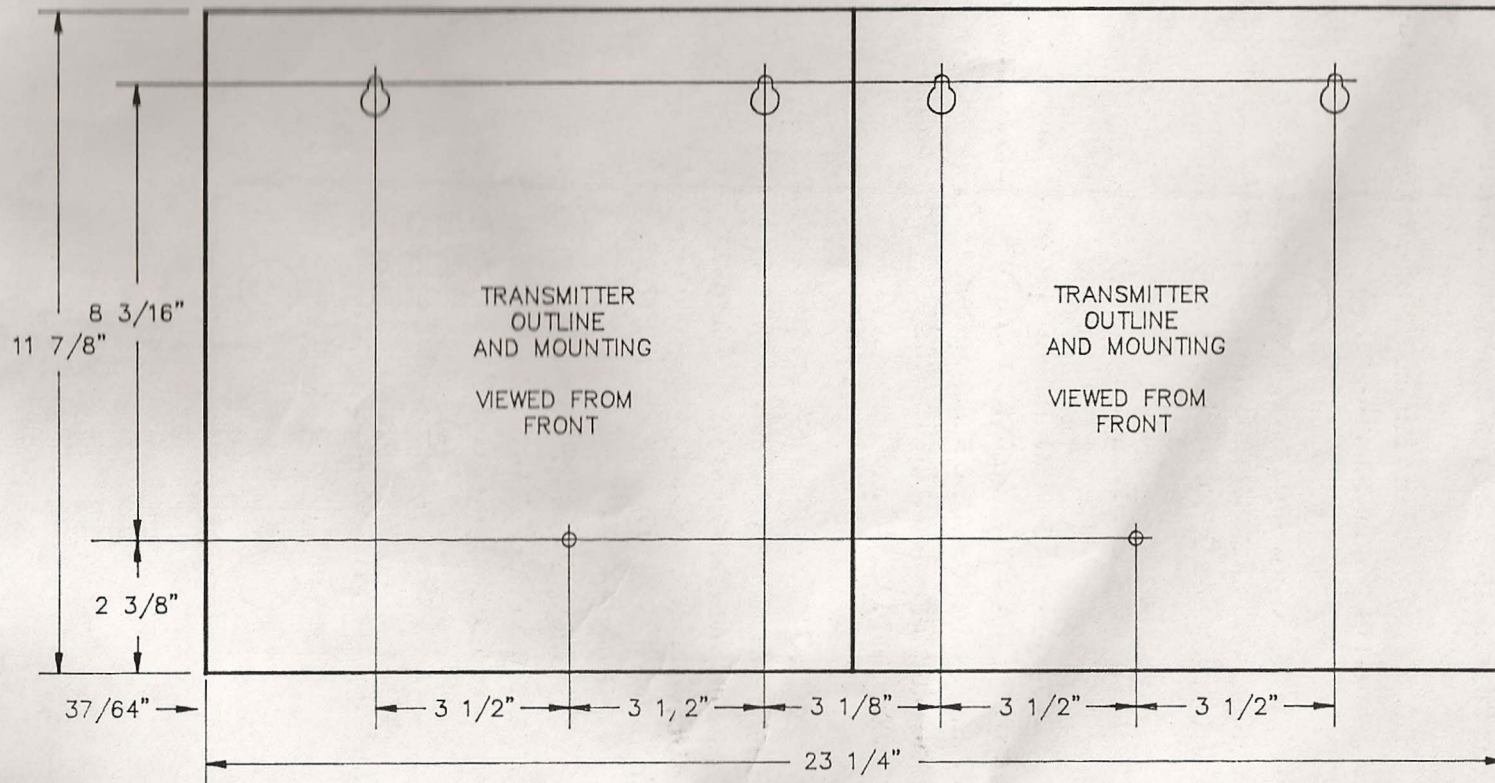
### 5.2 Interfacing the Transmitter

**AC power:** The transmitter requires a standard 117 vAC, 50/60 Hz. outlet. A 6 foot, 3 conductor line cord with 3 pin AC plug is supplied. If an RF ground loop is encountered between the station ground and the AC power system ground, use a 3-to-2 prong plug adapter on the transmitter AC line cord. **DO NOT REMOVE GROUND PIN FROM PLUG.**

**AUDIO:** The audio input impedance is 600 ohm transformer balanced. Any input level between -15 dBm and +15 dBm (0.14 Vrms to 4.3 Vrms) will provide 100% modulation (with the Audio Gain control R4 properly set). Connect the audio feed line to the AUDIO IN terminal block located on the bottom of the transmitter chassis. (see Fig. 8)

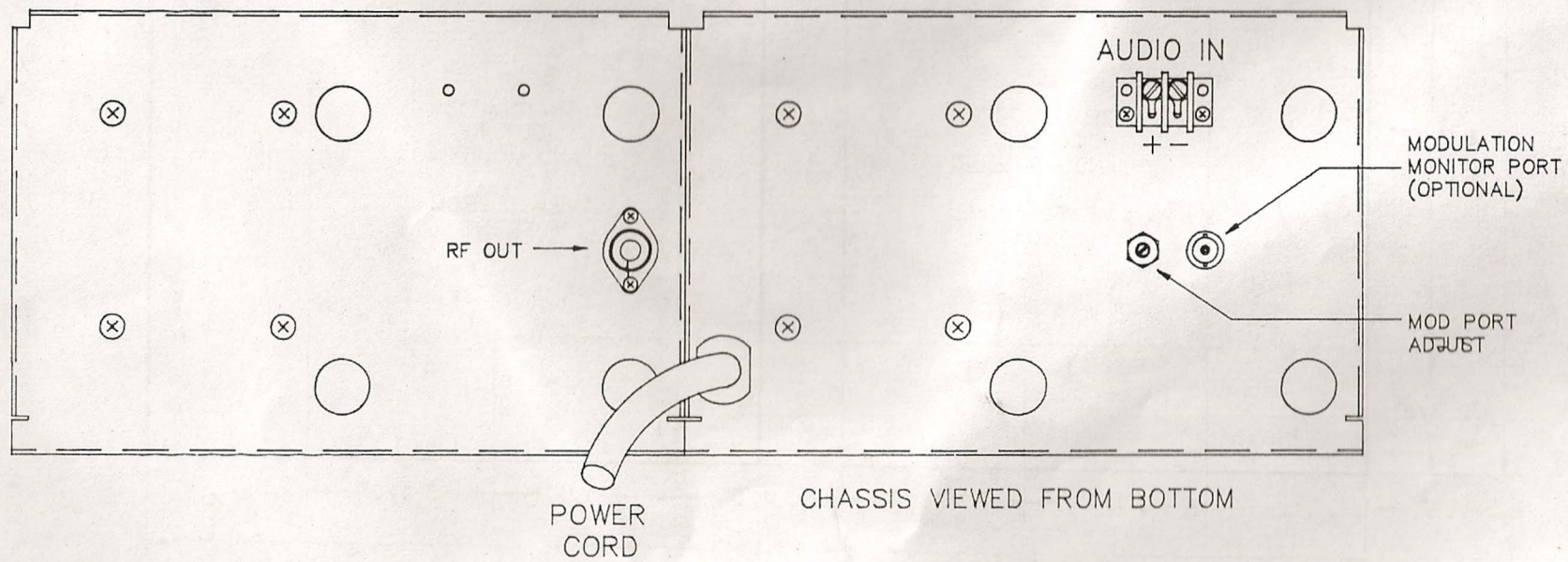
**RF Output:** The RF output impedance is industry-standard 50 ohms, unbalanced, using an SO-239 UHF type connector (see Fig. 8). The RF output cable must be 50 ohm coaxial. Type RG-8/U is recommended.

## 6.0 CONTROL SETTINGS AND OPERATION



TRANSMITTER MOUNTING DIMENSIONS  
 FIGURE 7

PHOTO 6 A



TRANSMITTER CONNECTIONS  
 FIGURE 8

PAGE 6 B

## 6.1 User Control Descriptions and Locations

A number of trimpots are located inside the transmitter. Some are factory set and sealed. Removing any of the seals will void the warranty.

User adjustable controls include:

**Power Switch (S1)** located on the power supply board, same chassis section as the exciter board. The red LED, on each power supply will be on when power is applied.

**Meter Switch (S2)** located below the meter on the exciter board. This switch selects the function of the meter to indicate Relative RF Power Output or Percent Modulation.

**Audio Gain (R4)** located on the upper left corner of the exciter. This adjusts the audio gain of the transmitter to provide 100% modulation for any audio input level between -15 dBm and +15 dBm.

**RF Drive (R31)** located lower center of exciter board. This control adjusts the RF drive to each of the final power amplifiers simultaneously for the desired RF output power between 20% and 100% of rated TPO.

**Frequency Trim (C47)** located just below the crystal on the exciter board. If frequency drift is encountered, this variable capacitor enables adjustment of the operating frequency.

## 6.2 Setup and Operation

Refer to section 6.1 of this manual and the operating instructions located on the inside of the transmitter front panel. With power switch (S1) off (down position) make sure RF Drive level (R31) and Audio Gain (R4) are at MINIMUM (full counter-clockwise).

1. Be sure all connections to and from the transmitter are secure.
2. Turn transmitter power switch on.
3. Place Meter Function Switch in the Relative RF Output position (REL RF OUT).

4. Set RF Drive control (R31) for the minimum power required for the application. This may be measured using the Relative RF Output Meter. This meter reads RF output **voltage** referenced to 100% TPO. To convert the meter reading to power out in watts use the following equation:

$$(\text{METER READING} / 100)^2 \times \text{RATED TPO} = \text{WATTS (APPROX.)}$$

Example: Meter reads 70, TPO = 30 watts

$$(70 / 100)^2 \times 30 = 14.7 \text{ watts}$$

NOTE: As mentioned before, this method is not accepted by the FCC and is to be used as an initial reference only. Use of an RF Ammeter to measure the output to the antenna is required.

6. Apply program material (audio source) to transmitter. Set Meter Function Switch to percent modulation position (% MOD).
7. Adjust Audio Gain Control (R4) as follows:
  - a. Set gain so that meter reads no higher than 50% during loudest program material peaks.

NOTE: Modulation can also be set using an oscilloscope by connecting the scope probe across the RF output. Adjust the Audio Gain (R4) so that the negative modulation peaks are just beginning to pinch off the carrier, then back off R4 slightly. At a short distance from the transmitter, use any AM radio to listen for distortion and check the quality of the audio. Placing the radio close to the transmitter may cause input overloading to the radio and result in a misleading interpretation of signal quality.

## 7.0 MONITORING AND REMOTE CONTROL

Additions such as a modulation port and remote adjustment of power output are specialized to the individual needs of the user. These options are available from LPB on special order. The user may also easily add these options.

## 7.1 Modulation Monitoring

Common modulation monitors include:

<u>mfgr &amp; model</u>	<u>input, ohms</u>	<u>input, Vrms</u>	<u>recommended input, Vrms</u>
Belar AMM-2	1k standard (50 ohm opt)	5 to 10	5.5
Belar AMM-3	1k standard (50 ohm opt)	5 to 10	5.5
TFT 753	50 ohm	1 to 10	5.5

There are many ways to accomplish the voltage division required at the transmitter output to drive the modulation monitor input. A resistive divider consumes excessive power for a low power transmitter and requires non-inductive resistors. A bridging transformer is difficult because it requires an impractical number of turns. A capacitive divider seems to be the most practical approach (see Fig. 9).

Capacitor  $C_m$  can be calculated from:

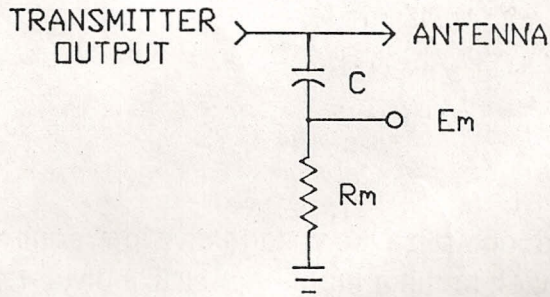
$$C_m = \frac{3.18 \times 10^{-3}}{f [(E_o/E_m)^2 - 1]^{1/2}} \text{ in pfd.} \quad f = \text{operating frequency in Hz.}$$

The power drawn from the transmitter by the modulation monitor is:

$$P_m = \frac{(E_m)^2}{50} \text{ in watts} \quad (\text{Note: } P_m \text{ will be below 1 watt})$$

## 7.2 LPB Tri-Power Option

If the transmitter is equipped with this option, a two screw terminal block and a wing nut will be found on the bottom of the chassis. These connection points are labeled "A", "B" and "Gnd". Grounding the "A" terminal will cause the transmitter to operate at its lowest factory-set TPO. Grounding the "B" terminal will cause the transmitter to operate at its mid factory-set TPO. With both the "A" and "B" terminals grounded, the transmitter will operate at maximum factory-set TPO. (refer to figures 10 & 11).



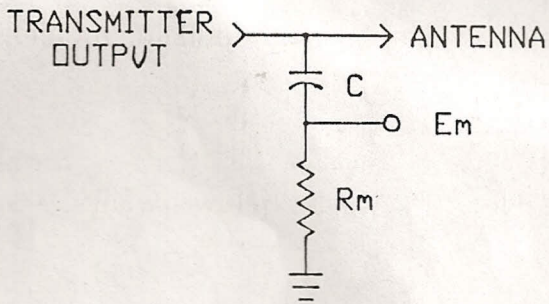
$E_o$ : Transmitter output,  
10 to 38.7 Vrms  
(2 to 30w, 50 ohms)

$C$ : Depends on  $E_o$ ,  
to be calculated

$E_m$ : Modulation monitor input  
(use 5.5 Vrms)

$R_m$ : 50 ohms, either a 2 watt  
metal oxide resistor or  
the modulation monitor  
input (where 50 ohms)

### CAPACITIVE DIVIDER



$$E_o = 25 \text{ rms}$$

$$f = 1260 \text{ kHz}$$

$$E_m = 5.5 \text{ Vrms}$$

$$C = 570 \text{ pf}$$

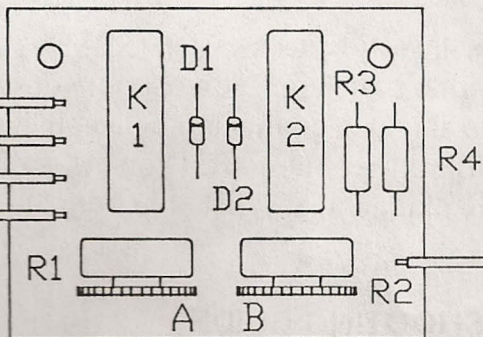
$$P_m = 0.61 \text{ w}$$

### EXAMPLE OF A CAPACITIVE DIVIDER

FIG. 9

22 AWG

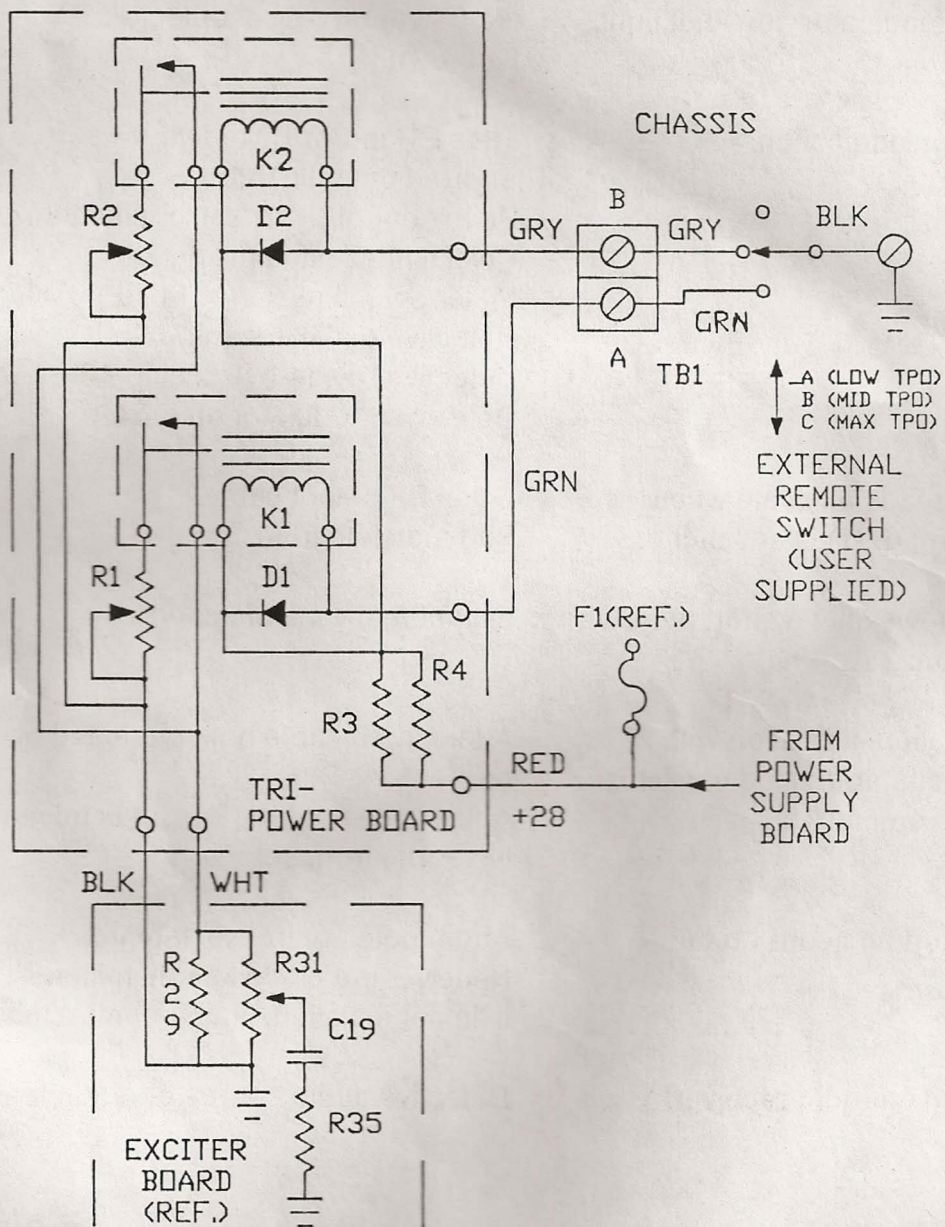
WHITE  
BLACK  
GRAY  
GREEN



18 AWG  
RED

TRI-POWER OPTION  
BOARD COMP. LAYOUT

FIG. 10



TRI-POWER OPTION  
SCHEMATIC

FIG. 11



A single pole, three position switch (SPTT) is all that is needed to select the desired TPO. This external switch must be capable of switching 10 mA. at 28 vDC. A two conductor cable with shield is connected between the terminal block and switch. It should be noted that the RF drive control (R31) on the exciter board carries RF, NOT DC. Therefore, it cannot be placed at any distance from the exciter board.

## 8.0 BASIC TROUBLESHOOTING GUIDE

Problem	Possible Cause
LED power indicator does not light.	No power on AC receptacle F1 blown.
No RF output indication.	Fuse F1 and/or F2 blown. Shorted output cable. Drive control (R31) set to minimum. Crystal not seated properly. Meter Switch (S2) in % MOD position. Defective oscillator chip A2. Defective Divide-by-six chip A3. Defective Modulator chip A4.
RF output reads off scale when drive control (R31) is advanced.	Open RF output cable. Bad match to load.
Fuse F2 blows after a short period of operation.	Output badly mismatched.
No modulation indication with RF output OK (unmodulated carrier is heard on a monitor).	Audio input cable not connected or bad. Audio gain control (R4) set at minimum. No audio from source.
Audio distortion heard on radio receiver.	Audio gain control set too high. Receiver too close to transmitter. If limiter installed, limiter control misadjusted.
Hum heard on radio receiver.	Defective audio source or audio feed line.

## 9.0 MAINTENANCE

These transmitters are designed for continuous 24-hour service. Periodic checks of the transmitter and associated equipment are recommended to catch any problems that may rise.

## 10.0 PARTS LIST AND SCHEMATIC

Following this section is a complete set of parts lists and schematics. Refer to these lists for component values and LPE part numbers.

L P B P A R T S L I S T

RF POWER AMPLIFIER MODULE

PAGE 1

ASSY NO. 6005-A

PAGE 1

DATE 2/20/90

SUPERCEDES 7/25/89

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-30/60/100, RF POWER AMP. PCB.	671-6008-A	
R39	1	1K OHM TRIMPOT, VERT MNT, THMBWHL ADJ	775-1080	
R40	1	680 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2117	
R41	1	4.7 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2065	
R42	1	22 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2081	
R43	1	22 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2081	
C26	1	2200 MFD AL CAP AXL 35V -10/+50 %	172-2197	
C27	1	.1 MFD CER DISC CAP 50V	174-1254	
C28	1	22 MFD AL CAP RAD 63V +/-20 %	172-1067	
C29	1	.1 MFD CER DISC CAP 50V	174-1254	
C30	1	.33 MFD MYLAR CAP 100V 10%	175-1091	
C37	1	470 MFD AL CAP AXL 50V -10/+50 %	172-2153	
C38	1	.1 MFD CER DISC CAP 50V	174-1254	
A5	1	LM317H ADJ VOLT REG IC (TO-5)	363-1001	
D10	1	1N4007-1000V, 1A SILICON RECTIFIER	781-1037	
Q4	1	2N5190 NPN SIL PWR TRANSISTOR, PLAS	782-1105	1
Q5	1	SD-1407 NPN RF PWR XSTR, 28V, HI-GAIN	782-1211	1
Q6	1	SD-1407 NPN RF PWR XSTR, 28V, HI-GAIN	782-1211	1
L2	1	0.75" FERRITE TOROID	201-1005	2
L3	1	0.75" FERRITE TOROID	201-1005	2
T3	1	0.75" FERRITE TOROID	201-1005	3
T4	1	1.1 " FERRITE TOROID	201-1006	4
2	1	AM-30 RFA HEATSINK	333-6035-A	
3	1	TO-5 PRESS-ON HEATSINK	332-1005	
4	5	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
5	6	6-32 X 1/2" PAN HD SCREW PHILLIPS	301-1212	
6	6	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
7	6	10-24 HEX NUT W/LOCKWASHER (KEPS)	302-6020	
9	4	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
10	1	#4 COMPRESSION WASHER	789-1021	
11	1	MICA INSULATOR, .5" X .85"	789-1016	1
	15	18 AWG PVC HOOK-UP WIRE, RED	931-1022	5
	17	18 AWG PVC HOOK-UP WIRE, BLACK	931-1021	5
	15	18 AWG PVC HOOK-UP WIRE, WHITE	931-1020	5
	12	22 AWG PVC HOOK-UP WIRE, RED	931-1003	5
	14	22 AWG PVC HOOK-UP WIRE, BLACK	931-1002	5
	12	22 AWG PVC HOOK-UP WIRE, WHITE	931-1001	5
C31	1	-	-	6
C32	1	-	-	7
C33	1	-	-	8
C34	1	-	-	9
C35	1	-	-	10
L4	1	-	-	11
L5	1	-	-	12

CONTINUED ON PAGE 2

P 1

L P B P A R T S L I S T

RF POWER AMPLIFIER MODULE

*pages 2*

ASSY NO. 6005-A  
 PAGE 2  
 DATE 2/20/90  
 SUPERCEDES 7/25/89

NOTES:

1. USE A THIN COAT OF THERMAL HEATSINK COMPOUND BETWEEN COMPONENT AND HEATSINK - SCRAPE PAINT IN REQUIRED.
2. 52 UH FERRITE CORE COIL TOROIDAL - SEE SCD #184-1005
3. RF TOROIDAL TRANSFORMER INPUT TRIFILAR - SEE SCD #865-1005
4. RF TOROIDAL TRANSFORMER OUTPUT TRIFILAR - SEE SCD #865-1010
5. QUANTITY EQUALS LENGTH IN INCHES.
6. FILTER COMPONENT VALUES VS. FREQUENCY RANGE:  

	-----LOW BAND-----	-----MID-BAND-----	-----HIGH-BAND-----
C31	3600PF (171-1218)	2400PF (171-1202)	2000PF (171-1197)
7. C32	1000PF (171-1176)	680PF (171-1164)	220PF (171-1120)
8. C33	5600PF (171-1236)	3600PF (171-1218)	3300PF (171-1215)
9. C34	3300PF (171-1215)	2200PF (171-1200)	750PF (171-1167)
10. C35	2200PF (171-1200)	1500PF (171-1188)	1600PF (171-1191)
11. L4	9.3uH SCD #184-1032	6.1uH SCD #184-1023	5.5uH SCD #184-1021
12. L5	5.8uH SCD #184-1024	3.8uH SCD #184-1018	4.0uH SCD #184-1018

L P B P A R T S L I S T

AM-30/60/100 EXCITER BOARD ASSEMBLY

ASSY NO. 6010-F

PAGE 1

DATE 2/20/90

SUPERCEDES 11/21/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-30/60/100, EXCITER PCB.	671-6013-A	
R3	1	620 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2116	
R4	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	
R5	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R6	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R7	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R9	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R10	1	100 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2097	
R11	1	100 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2097	
R12	1	1K OHM TRIMPOT, HORZ MNT, SCRDR ADJ	775-1085	1
R13	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R14	1	100 OHM, 2W, 5% RESISTOR, MET OXIDE	763-4097	2
R15	1	820 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2119	
R16	1	1K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2121	
R17	1	1K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2121	
R18	1	1.8K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2127	
R19	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R20	1	3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2132	
R21	1	100 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2097	
R22	1	1K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2121	
R23	1	820 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2119	
R24	1	100 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2097	
R25	1	47 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2089	
R26	1	1.3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2124	
R27	1	3K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2132	
R28	1	10K OHM TRIMPOT, HORZ MNT, THMWHL ADJ	775-1135	1
R29	1	2.2K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2129	
R30	1	100K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2169	
R31	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	
R32	1	300 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2108	
R33	1	1K OHM, 2W, 5% RESISTOR, MET OXIDE	763-4121	2
R34	1	1K OHM, 2W, 5% RESISTOR, MET OXIDE	763-4121	2
R35	1	220K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2177	
R36	1	50 OHM, 5W, 5% RESISTOR, WIREWND	765-1247	2
R37	1	3.3 OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2061	
R47	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R51	1	10K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2145	
R52	1	22K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2153	
R53	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R54	1	47K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2161	
R55	1	1K OHM TRIMPOT, HORZ MNT, SCRDR ADJ	775-1085	1
C4	1	.1 MFD CER DISC CAP 50V	174-1254	
C5	1	.001 MFD CER DISC CAP 1000V	174-1155	
C6	1	1.0 MFD AL CAP RAD 50V -10/+75 %	172-1007	
C7	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C8	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	

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L P B P A R T S L I S T

AM-30/60/100 EXCITER BOARD ASSEMBLY

PAGE 2

ASSY NO. 6010-F

PAGE 2

DATE 2/20/90

SUPERCEDES 11/21/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
C9	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C10	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C11	1	.1 MFD CER DISC CAP 50V	174-1254	
C12	1	.1 MFD CER DISC CAP 50V	174-1254	
C14	1	.1 MFD CER DISC CAP 50V	174-1254	
C15	1	.1 MFD CER DISC CAP 50V	174-1254	
C16	1	100MFD TANT CAP RAD 20V	173-1094	
C17	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
C18	1	.1 MFD CER DISC CAP 50V	174-1254	
C19	1	.001 MFD CER DISC CAP 1000V	174-1155	
C20	1	100MFD TANT CAP RAD 20V	173-1094	
C21	1	.1 MFD CER DISC CAP 50V	174-1254	
C22	1	.1 MFD CER DISC CAP 50V	174-1254	
C23	1	.33 MFD MYLAR CAP 100V 10%	175-1091	
C24	1	.15 MFD MYLAR CAP 100V 10%	175-1079	
C25	1	.001 MFD CER DISC CAP 1000V	174-1155	
C44	1	100 MFD AL CAP RAD 25V -10/+50 %	172-1117	
A1	1	RM741DC LINEAR IC (14 PIN DIP)	361-1013	
A2	1	MC12061P DIGITAL IC (16 PIN DIP)	364-1005	
A3	1	LM7492FC DIGITAL IC (14 PIN DIP)	364-1001	
A4	1	MC1496P LINEAR IC (14 PIN DIP)	361-1023	
A6	1	RM741DC LINEAR IC (14 PIN DIP)	361-1013	
D4	1	1N4742A-12V,1W,5% ZENER DIODE	781-1072	
D5	1	1N270 GERMANIUM SIGNAL DIODE	781-1015	
D6	1	1N270 GERMANIUM SIGNAL DIODE	781-1015	
D7	1	1N270 GERMANIUM SIGNAL DIODE	781-1015	
D8	1	1N270 GERMANIUM SIGNAL DIODE	781-1015	
D9	1	1N4733A-5.1V,1W,5% ZENER DIODE	781-1063	
T2	1	600:600 LINE IN XFR BOBBIN LPB-B12	863-1075	
L1	1	330UH FERRITE CORE COIL-MOLDED	184-1330	
L6	1	0.75" FERRITE TOROID	201-1005	3
2	14	20 AWG MAGNET WIRE,NYLEZE,RED	939-1012	4
S2	1	DPDT MIN TOGGLE SWITCH,PC MOUNT	821-1013	
Q2	1	2N3904 NPN SIL SIG TRANSISTOR,TO-92	782-1072	
Q3	1	2N3879 NPN SIL PWR TRANSISTOR,TO-66	782-1069	5
X1	1		-	6
3	1	XTAL SOCK .5" CTR PLASTIC PC MOUNT	216-1002	
4	1	1.5"VU METER B SCALE (DC TYPE)	541-1001	
5	1	20 AWG TINNED COPPER BUS WIRE	935-1016	4
6	1	TRANSISTOR SOCKET,3 PIN,TO-5,NYLON	789-1001	
7	1	TO-66 PC BOARD MNT HEATSINK 1.25"H	331-1012	
8	3	14 PIN IC SOCKET RECESSED	365-1003	
9	1	14 PIN HEADER SOCKET	365-1010	
10	1	16 PIN IC SOCKET RECESSED	365-1005	
11	2	6-32 X 3/8" PAN HD SCREW PHILLIPS	301-1208	
12	2	4-40 HEX NUT	302-1005	

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L P B P A R T S L I S T

AM-30/60/100 EXCITER BOARD ASSEMBLY

PAGE 3

ASSY NO. 6010-F

PAGE 3

DATE 2/20/90

SUPERCEDES 11/21/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
14	2	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
15	2	18 AWG TINNED COPPER BUS WIRE	935-1017	4
16	1	20 AWG PVC TUBING,CLEAR	936-1003	4

NOTES:

1. MOUNT ON BOTTOM OF PC BOARD.
2. MOUNT SO BODY OF COMPONENT IS 1/8" TO 3/16" ABOVE BOARD.
3. 52 UH FERRITE CORE COIL TOROIDAL - SEE SCD #184-1005
4. QUANTITY EQUALS LENGTH IN INCHES.
5. USE A THIN COAT OF THERMAL HEATSINK COMPOUND BETWEEN COMPONENT AND HEATSINK - SCRAPE PAINT IN REQUIRED.
6. 6X CRYSTAL, STANDARD TOLERANCE, 10 KHZ SPACING (212-XXXX)

L P B P A R T S L I S T

AM-30 POWER SUPPLY ASSEMBLY

ASSY NO. 6015-A

PAGE 1

DATE 2/20/90

SUPERCEDES 11/23/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-30/60/100,POWER SUPPLY PCB.	671-6018-B	
R1	1	1K OHM,1/2W,5% RESISTOR,CARB FILM	762-2121	
R2	1	390 OHM,1/2W,5% RESISTOR,CARB FILM	762-2111	
D2	1	1N4751A-30V,1W,5% ZENER DIODE	781-1081	
D3	1	1N4007-1000V,1A SILICON RECTIFIER	781-1037	
DL	1	LED T-1-3/4 -RED	473-1006	
C2	1	220 MFD AL CAP AXL 50V -10/+50 %	172-2132	
C3	1	6800 MFD AL CAP AXL 25V -10/+50 %	172-2228	
	1	QUICK FIT FUSE COVER	699-1020	
F1	1	2-1/2 AMP,250V,SLO-BLO FUSE	691-1017	
TR1	1	2 AMP INRUSH CURRENT SUPPRESSOR	696-1002	
2	2	PC MOUNT FUSE CLIPS	699-1001	



L P B P A R T S L I S T

AM-30 CHASSIS ASSEMBLY

ASSY NO. 6020-A

PAGE 1

DATE 2/20/90

SUPERCEDES 11/21/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	RF CHASSIS	521-6036-C	
C1	1	9600 MFD AL CAP CAN 50V	172-3040	
V1	1	40VAC, 400A PEAK, MET-OX-VARISTOR	695-1020	
T1	1	56V 2A PWR XFMR CH MNT 56-2	861-1065	
2	1	MOUNTING BRACKET FOR 172-3040	172-3043	
	1	18 AWG 3-COND POWER CORD, GRAY VINYL	939-1003	
4	3	6-32 X 3/8" PAN HD SCREW PHILLIPS	301-1208	
5	1	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
6	4	10-32 X 1/2" PAN HD SCREW PHILLIPS	301-1512	
8	4	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
9	4	10-32 HEX NUT	302-1020	
F1	1	CHASSIS MOUNT FUSEHOLDER	699-1010	
12	4	#10 EXTERNAL TOOTH LOCKWASHER	303-1020	
13	2	#10 SOLDER LUG	306-1020	
14	4	1" NYLON VENT PLUG	309-7025	
15	25	18 AWG PVC HOOK-UP WIRE, BLACK	931-1021	1
16	10	18 AWG PVC HOOK-UP WIRE, RED	931-1022	1
17	3	20 AWG PVC TUBING, CLEAR	936-1003	
	1	2 SCR TERM BLK BHD MNT 3/8 CTR	191-1003	
	1	SQ-239 UHF CONNECTOR 2 HOLE MOUNT	194-1006	

NOTES:

1. QUANTITY EQUALS LENGTH IN INCHES.

L P B P A R T S L I S T

AM-30/60 TRI-POWER OPTION

ASSY NO. 6025-A

PAGE 1

DATE 5/5/88

SUPERCEDES 1/5/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-30/60 TRANSMITTER TRI-POWER PCB	671-6028-A	
R1	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	1
R2	1	10K OHM TRIMPOT, VERT MNT, THMWHL ADJ	775-1130	1
R3	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
R4	1	4.7K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2137	
D1	1	1N4148 SILICON SIGNAL DIODE	781-1048	
D2	1	1N4148 SILICON SIGNAL DIODE	781-1048	
K1, K2	2	1FORM A (SPST-NO) REED RELAY, 5V COIL	741-1001	
20	5	6" SELF-LOCKING NYLON TIE-WRAP	937-1004	
TB1	1	2 SCR TERM BLK BHD MNT 3/8 CTR	191-1003	
2	2	4-40 X 5/16" PAN HD SCREW PHILLIPS	301-1106	
3	1	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
4	2	4-40 HEX NUT	302-1005	
5	5	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
6	1	6-32 SOLID WING NUT	302-5010	
7	2	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
8	1	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
9	2	#6 FLAT WASHER	303-4010	
10	2	1/2" X 1/2" L BRACKET	305-1012	
11	1	#6 SOLDER LUG	306-1010	
12	4	22 AWG PVC HOOK-UP WIRE, WHITE	931-1001	2
13	4	22 AWG PVC HOOK-UP WIRE, BLACK	931-1002	2
14	12	22 AWG PVC HOOK-UP WIRE, GREEN	931-1004	2
15	12	22 AWG PVC HOOK-UP WIRE, GRAY	931-1009	2
16	7	18 AWG PVC HOOK-UP WIRE, RED	931-1022	2
17	2	6-32 X 5/16" PAN HD SCREW PHILLIPS	301-1206	
18	2	6-32 X 1/2" PAN HD SCREW PHILLIPS	301-1212	
19	2	TRI-POWER "A - B" STICKER	444-6025-A	

NOTES:

1. TRIMPOT VALUE WILL VARY DEPENDING ON USER TPO REQUIREMENTS
2. QUANTITY EQUALS LENGTH IN INCHES.

L P B P A R T S L I S T

AM-60 COMBINER ASSEMBLY

ASSY NO. 6104-A

PAGE 1

DATE 2/21/90

SUPERCEDES 12/1/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
2	1	AM-30 POWER SUPPLY ASSEMBLY	6015-A	
3	1	RF CHASSIS	521-6036-C	
C50	1	9600 MFD AL CAP CAN 50V	172-3040	
	1	MOUNTING BRACKET FOR 172-3040	172-3043	
D1	1	RECTIFIER BRIDGE-50V,6A	781-1155	1
Q1	1	MJE6043 NPN DARLINGTON PR XSTR,PLAS	782-1127	1
P1	1	MOLEX PLUG 3 HOLE	195-1002	
V2	1	40VAC, 400A PEAK,MET-OX-VARISTOR	695-1020	
T5	1	56V 2A PWR XFMR CH MNT 56-2	861-1065	
T6	1	2.4 " FERRITE TOROID	201-1009	2
T7	2	1.1 " FERRITE TOROID	201-1006	3
T8	1	2.4 " FERRITE TOROID	201-1009	4
R55	1	50 OHM, 25W, 5% RESIS,W/W,NON-IND	766-1247	1
R56	1	50 OHM, 25W, 5% RESIS,W/W,NON-IND	766-1247	1
F3	1	4 AMP,250V,NON-TIME-DELAY FUSE	692-1021	
	1	2+1 LH MNT TERMINAL STRIP PHENOLIC	197-1011	
	2	2+1 CTR MNT TERMINAL STRIP PHENOLIC	197-1009	
	1	1+1 RH MNT TERMINAL STRIP PHENOLIC	197-1002	
5	1	SD-239 UHF CONNECTOR 2 HOLE MOUNT	194-1006	5
SA	1	300-500VDC SURGE ARRESTOR	697-1015	
6	3	MOLEX PIN (FOR 195-1002)	195-1005	
7	8	6-32 X 1/4" PAN HD SCREW PHILLIPS	301-1204	
8	7	6-32 X 3/8" PAN HD SCREW PHILLIPS	301-1208	
9	7	4-40 X 1/4" PAN HD SCREW PHILLIPS	301-1104	
10	1	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
11	4	10-32 X 1/2" PAN HD SCREW PHILLIPS	301-1512	
12	4	4-40 HEX NUT	302-1005	
13	2	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
14	4	10-32 HEX NUT	302-1020	
15	13	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
16	15	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
17	4	#10 EXTERNAL TOOTH LOCKWASHER	303-1020	
18	4	6-32 X 3/8" HEX THREADED SPACER	304-1078	
19	1	#4 SOLDER LUG	306-1005	
20	5	#6 SOLDER LUG	306-1010	
23	4	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
24	4	1" NYLON VENT PLUG	309-7025	
25	1	CHASSIS MOUNT FUSEHOLDER	699-1010	
27	1	MICA INSULATOR,.5" X .85"	789-1016	1
28	1	#4 COMPRESSION WASHER	789-1021	
29	19	22 AWG PVC HOOK-UP WIRE, GREEN	931-1004	6
30	22	22 AWG PVC HOOK-UP WIRE, BLUE	931-1006	6
31	23	18 AWG PVC HOOK-UP WIRE, WHITE	931-1020	6
32	92	18 AWG PVC HOOK-UP WIRE, BLACK	931-1021	6
33	68	18 AWG PVC HOOK-UP WIRE, RED	931-1022	6
34	15	18 AWG PVC HOOK-UP WIRE, GREEN	931-1025	6

CONTINUED ON PAGE 2

L P B P A R T S L I S T

AM-60 COMBINER ASSEMBLY *PAGE 2*

ASSY NO. 6104-A  
 PAGE 2  
 DATE 2/21/90  
 SUPERCEDES 12/1/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
35	32	18 AWG PVC HOOK-UP WIRE, GRAY	931-1029	6
36	9	18 AWG TINNED COPPER BUS WIRE	935-1017	6
37	10	16 AWG TEFLON TUBING, CLEAR	936-1008	6
38	1	20 AWG TINNED COPPER BUS WIRE	935-1016	6
39	3	6" SELF-LOCKING NYLON TIE-WRAP	937-1004	
40	6	LOCKING NYL TIE-WRAP W/6-32 INSERT	937-1009	
42	1	"CAUTION LINE VOLTAGE" LABEL	444-1000	
43	172	20 AWG MAGNET WIRE, NYLEZE, RED	939-1012	6
44	135	20 AWG MAGNET WIRE, NYLEZE, GREEN	939-1013	6

NOTES:

1. USE A THIN COAT OF THERMAL HEATSINK COMPOUND BETWEEN COMPONENT AND HEATSINK - SCRAPE PAINT IN REQUIRED.
2. RF POWER SPLITTER TRANSFORMER - 2 WAY  
 A.) STANDARD 50% / 50% - SEE SCD #865-1022  
 B.) SPECIAL SPLITS - SEE DWG #?????????
3. RF COMBINER TRANSFORMER (9:13) - SEE SCD #865-2437-A
4. RF COMBINER TRANSFORMER (29:29) - SEE SCD #865-2438
5. REMOVE PAINT INSIDE CHASSIS UNDER MOUNTING HARDWARE
6. QUANTITY EQUALS LENGTH IN INCHES.

L P B P A R T S L I S T

AM-60 SIDE PANEL ASSEMBLY

ASSY NO. 6105-A  
 PAGE 1  
 DATE 2/21/90  
 SUPERCEDES 11/21/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-30 POWER SUPPLY ASSEMBLY	6015-A	
2	1	RF DRILLED SIDE PANEL	521-6033-C	1
Q1	1	MJE6043 NPN DARLINGTON FR XSTR,PLAS	782-1127	2
D1	1	RECTIFIER BRIDGE-50V,6A	781-1155	2
S1	1	SPDT MIN TOGGLE SWITCH,PC MOUNT	821-1005	
F1	1	MOLEX PLUG 3 HOLE	195-1002	
3	3	MOLEX PIN (FOR 195-1002)	195-1005	
4	1	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
5	8	6-32 X 1/4" PAN HD SCREW PHILLIPS	301-1204	
6	1	6-32 X 3/8" PAN HD SCREW PHILLIPS	301-1208	
7	1	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
8	1	4-40 HEX NUT	302-1005	
9	6	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
10	1	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
11	9	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
12	4	6-32 X 3/8" HEX THREADED SPACER	304-1078	
13	1	#6 SOLDER LUG	306-1010	
14	1	"CAUTION LINE VOLTAGE" LABEL	444-1000	
16	1	MICA INSULATOR,.5" X .85"	789-1016	2
17	1	#4 COMPRESSION WASHER	789-1021	
18	4	22 AWG PVC HOOK-UP WIRE,BLACK	931-1002	3
19	9	22 AWG PVC HOOK-UP WIRE,GREEN	931-1004	3
20	18	22 AWG PVC HOOK-UP WIRE,BLUE	931-1006	3
21	4	18 AWG PVC HOOK-UP WIRE,WHITE	931-1020	3
22	40	18 AWG PVC HOOK-UP WIRE,BLACK	931-1021	3
23	48	18 AWG PVC HOOK-UP WIRE,RED	931-1022	3
24	19	18 AWG PVC HOOK-UP WIRE,GRAY	931-1029	3
25	3	18 AWG TINNED COPPER BUS WIRE	935-1017	3
27	4	6-32 X 2" PAN HD SCREW,PHILLIPS	301-1278	
28	1	FAN, 115VAC, BALL BEARING, 36 CFM,	561-1005	4
29	1	1/4" ID GROMMET	309-3006	
30	1	1/2" ID GROMMET	309-3015	
31	1	1" ADHES BASE TIE-WRAP HOLD-DOWN,NY	937-1012	

NOTES:

1. REMOVE PAINT UNDER D1 & Q1 MOUNTING LOCATION IF NECESSARY. APPLY THIN COAT OF THERMAL HEATSINK COMPOUND.
2. USE A THIN COAT OF THERMAL HEATSINK COMPOUND BETWEEN COMPONENT AND HEATSINK - SCRAPE PAINT IN REQUIRED.

CONTINUED ON PAGE 2

L P B P A R T S L I S T

AM-60      SIDE PANEL ASSEMBLY  
*page 2*

ASSY NO. 6105-A  
PAGE 2  
DATE            2/21/90  
SUPERCEDES 11/21/88

3. QUANTITY EQUALS LENGTH IN INCHES.

4. MODIFY SIDE PANEL PER DWG. #6105-A BEFORE ASSEMBLYING

L P B P A R T S L I S T

AM-30 P EXCITER BOARD ASSEMBLY

ASSY NO. 6094-F

PAGE 1

DATE 2/20/90

SUPERCEDES 1/5/89

SYMBOL	QTY	DESCRIPTION	PART	NOTES
	1	AM-30/60/100 EXCITER BOARD ASSEMBLY	6010-F	1
C47	1	265 -880 PF VAR CAP COMP MICA 500V	179-1010	
1	1	NYLON FLAT WASHER 9/32" ID 1/2" OD	303-4030	
X1	1		-	2

NOTES:

1. MODIFY EXCITER PER ECO #2210-8312-2
2. REPLACE STANDARD TOLERANCE CRYSTAL (212-XXXX) WITH 6X CRYSTAL, .0005% HI-TOL. (213-XXXX)

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L P B P A R T S L I S T

AM-60 P SHELF ASSEMBLY

ASSY NO. 6151-A

PAGE 1

DATE 6/24/88

SUPERCEDES 6/10/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	1	AM-60 P FINAL ASSEMBLY	6152-A	
2	2	RF FRONT PANEL	521-6034-A	
3	4	LATCH GROMMET-NYLON	309-1021	
4	4	LATCH PLUNGER-NYLON	309-1020	
5	1	3' RG-58A/U COAX CABLE,W/PL-259(RFP	933-1040	
6	1	AM-30P/60P SELF ADHESIVE INSTR SHT	441-6093-A	
7	4	#10 X 1/2" HEX HD SHEET METAL SCREW	301-6412	
8	2	FORK LUG,#6 STUD,22-18 GA WIRE	195-1015	



L P B P A R T S L I S T

AM-60 P FINAL ASSEMBLY

ASSY NO. 6152-A

PAGE 1

DATE 11/21/88

SUPERCEDES 6/10/88

SYMBOL	QTY	DESCRIPTION	PART	NOTES
1	2	RF POWER AMPLIFIER MODULE	6005-A	
2	1	AM-30 P EXCITER BOARD ASSEMBLY	6094-F	
3	1	AM-60 CHASSIS ASSEMBLY	6153-A	
R38	1	12K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2147	1
R44	1	7.5K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2142	1
R45	1	1.5K OHM, 1/2W, 5% RESISTOR, CARB FILM	762-2125	1
R46	1	56 OHM, 5W, 5% RESISTOR, WIREWIND	765-1250	1
C36	1	.1 MFD CER DISC CAP 50V	174-1254	1
D11	1	1N34A GERMANIUM SIGNAL DIODE	781-1001	1
6	1	2 SCR TERM BLK BHD MNT 3/8 CTR	191-1003	
7	8	6-32 X 1/4" PAN HD SCREW PHILLIPS	301-1204	
8	7	6-32 X 3/8" PAN HD SCREW PHILLIPS	301-1208	
9	8	6-32 X 1/2" PAN HD SCREW PHILLIPS	301-1212	
11	18	6-32 HEX NUT W/LOCKWASHER (KEPS)	302-6018	
12	8	#6 EXTERNAL TOOTH LOCKWASHER	303-1010	
13	4	6-32 X 3/4" HEX THREADED SPACER	304-1086	
14	1	6-32 X 5/8" PAN HD SCREW PHILLIPS	301-1214	
15	8	22 AWG PVC HOOK-UP WIRE, WHITE	931-1001	2
16	2	#10 SOLDER LUG	306-1020	
17	178	RG-174/U COAXIAL CABLE	933-1019	2
18	1	1/8" PVC SHRINKABLE TUBING, BLACK	936-1024	2
19	10	6" SELF-LOCKING NYLON TIE-WRAP	937-1004	
20	4	1" ADHES BASE TIE-WRAP HOLD-DOWN, NY	937-1012	
25	1	4-40 X 3/8" PAN HD SCREW PHILLIPS	301-1108	
26	1	4-40 HEX NUT	302-1005	
27	1	#4 EXTERNAL TOOTH LOCKWASHER	303-1005	
F2	1	4 AMP, 250V, NON-TIME-DELAY FUSE	692-1021	

NOTES:

1. INSTALL IN RF AMPLIFIER ASSEMBLY #6005
2. QUANTITY EQUALS LENGTH IN INCHES.

L P B P A R T S L I S T

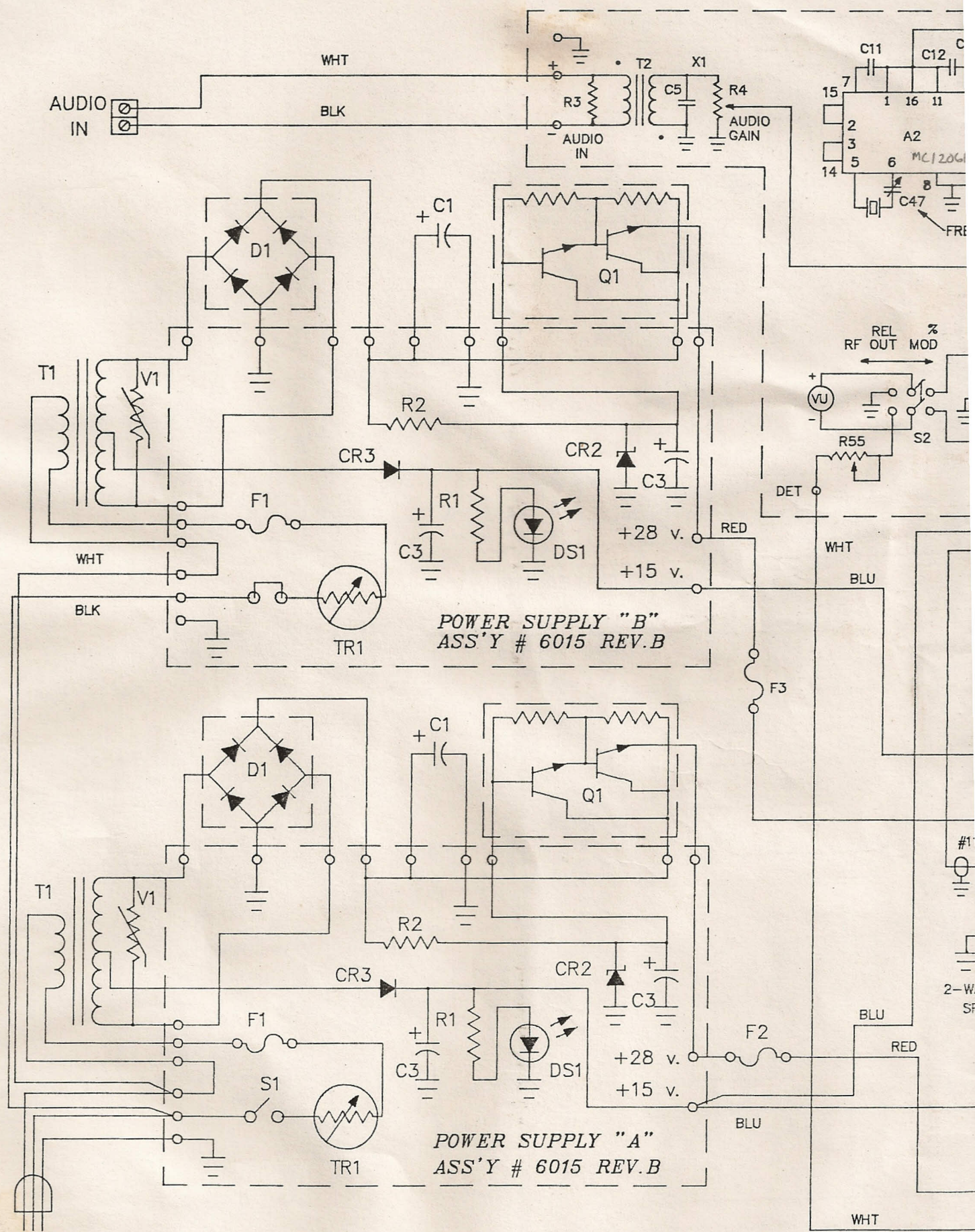
AM-60 CHASSIS ASSEMBLY

ASSY NO. 6153-A

PAGE 1

DATE 11/21/88

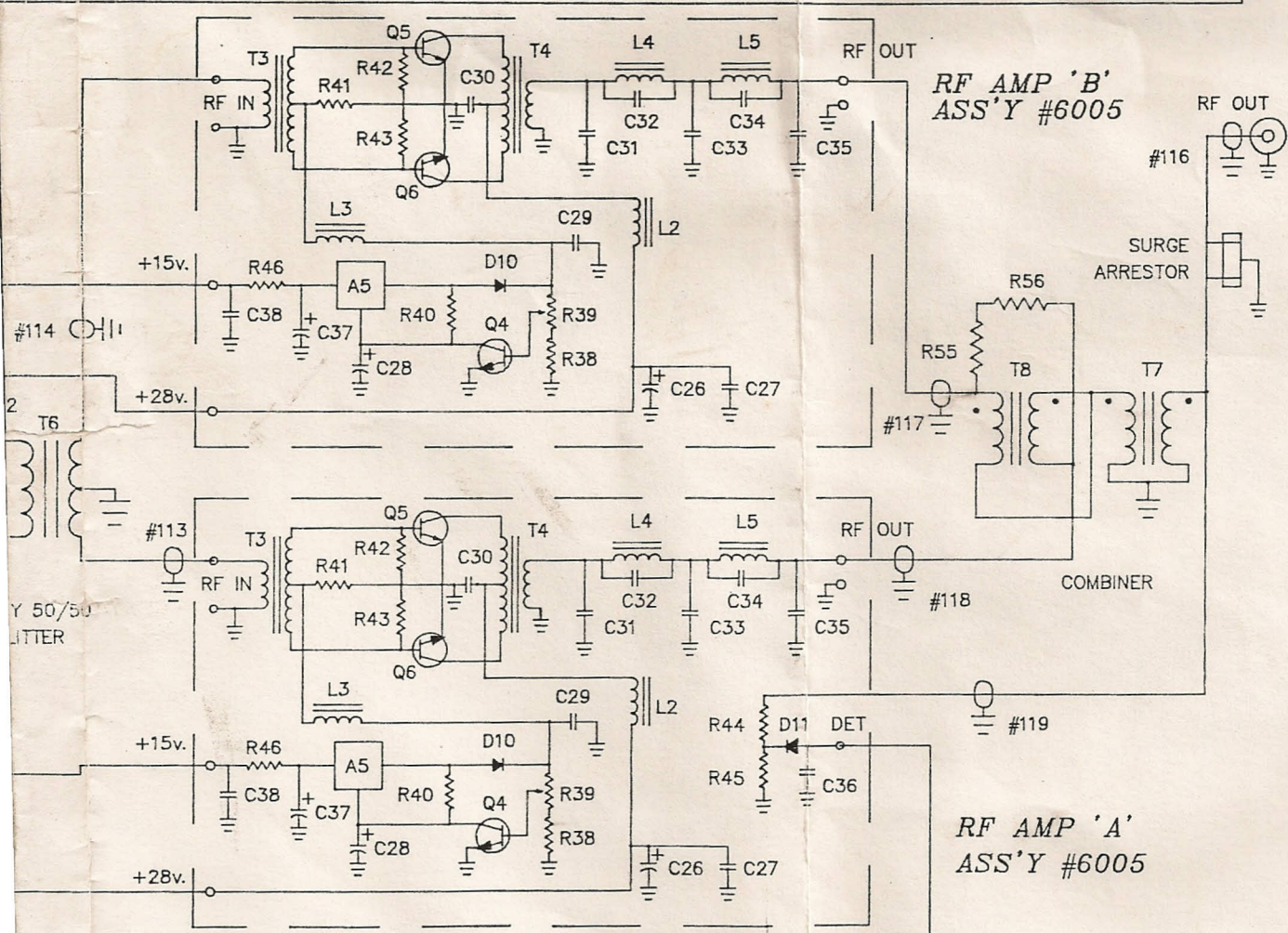
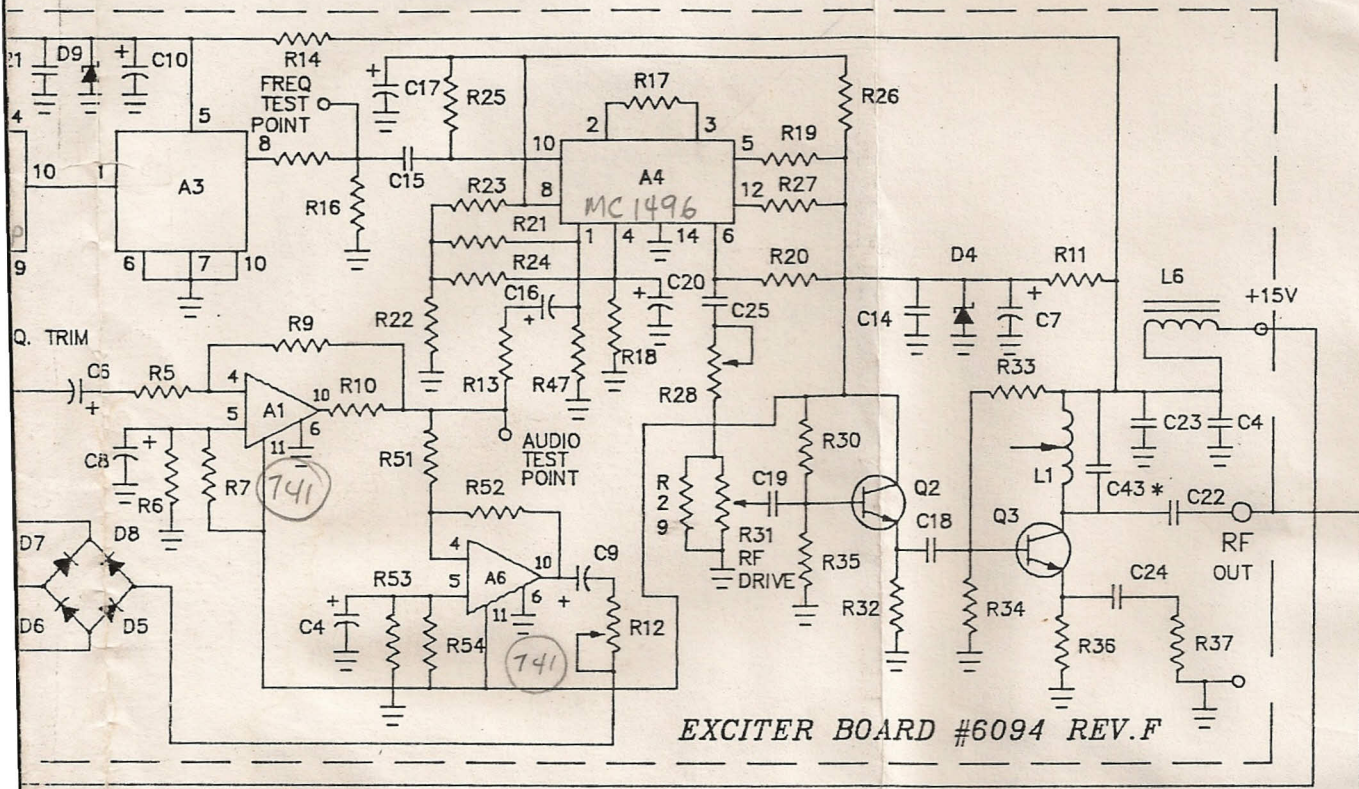
SYMBOL	QTY	DESCRIPTION	PART	NOTES
	1	AM-30 CHASSIS ASSEMBLY	6020-A	
	1	AM-60 SIDE PANEL ASSEMBLY	6105-A	
6104-A	1	AM-60 COMBINER ASSEMBLY	6104-A	
	4	#6 TINNERMAN NUT	302-3010	
	4	6-32 X 1/2" PAN HD SCREW PHILLIPS	301-1212	



POWER SUPPLY "B"  
ASS'Y # 6015 REV.B

POWER SUPPLY "A"  
ASS'Y # 6015 REV.B

AM-60P MAIN FRAME SCH



EMATIC # 6154 REV.D

\* NOTE: C43 IS FACTORY SELECTED  
 NOTE: R12, R28, R39, R55 FACTORY SET