TECHNICAL DATA

Nominal Input Voltage
13.2 volts DC

Nominal Output Voltage
11.6 volts DC

Regulation
±0.25 volts from no load to a load of 65 ohms
±0.5 volts with a 20% input voltage variation

DESCRIPTION

GENERAL

Refer to the schematic diagram of the Regulator Module while reading the following description.

The Regulator Module is normally used to provide a regulated +11.2 volt supply for the transmitter multiplier and low-power PA stages. The Module contains error amplifier, ripple filter, dc switch, and regulator driver stages. The series regulator transistor is mounted on the power amplifier chassis to provide heat dissipation.

DRIVER – Q3

The Driver transistor, Q3, directly controls the bias on the base of the external regulator transistor. A positive-going voltage on Q3 base will increase its conduction, thereby increasing the voltage on the base of the regulator transistor, increasing its conduction, and providing a higher output voltage. A negative-going voltage on Q3 base will decrease its conduction, decreasing the voltage on the base of the regulator transistor, which decreases its conduction and reduces the output voltage. The voltage at Q3 base appears when DC Switch transistor Q2 and Error Amplifier transistor Q4 are conducting.

DC SWITCH – Q1/Q2

The DC Switch circuit functions to turn the regulator on and off with the transmitter keying signal. With no input at pin 2, Q1 is biased off. Q2 base is more positive than the emitter, and the transistor does not conduct. When +13.6 volts is applied to pin 2 by the transmitter keying circuit, Q1 is biased on (base bias is derived from the voltage divider R3-R4). When Q1 conducts, the base voltage for Q2, derived from the junction of R1-R2, becomes less positive, biasing Q2 into conduction. When Q2 conducts, it connects Q3 base and Q4 collector to the DC input, allowing both transistors to conduct.

ERROR AMPLIFIER – Q4

Error Amplifier Q4 compares various feedback signals with a reference voltage developed by R6 and zener diode CR1, and provides a difference signal to the base of Q3 the set the amount of conduction of the regulator transistor. Three feedback loops are available; their use is determined by the transmitter in which the Regulator Module is used (see Transmitter-Receiver Unit instruction book).

Voltage feedback is developed by the voltage divider network of R7-R8-R9. If the output voltage starts to fall, the decrease in the voltage on the base of Q4 causes a decrease in its conduction. This makes the base of Q3 more positive, increasing the output voltage.

Temperature feedback is normally provided by a thermistor circuit that produces a feedback voltage at Regulator Module pin 12. As the temperature of the Power Amplifier transistors increases, the signal at pin 12 becomes more positive, increasing the conduction of Q4, and decreasing the conduction of the regulator transistor, reducing the output voltage.

A VSWR feedback voltage is applied to Regulator Module pin 10 in some transmitters. As the VSWR increases, the voltage on pin 10 increases, increasing the conduction of Q4, decreasing the voltage on the regulator transistor base and reducing the output voltage.

FILTER

L1-C4-C5 form a pi-section filter to attenuate AC components in the DC output at pin 15.

TIE POINTS

The Regulator Module contains a number of pin connectors that are used as tie points for cabling to other modules (ex. A+, 9V, etc.).

REPLACEMENT PARTS

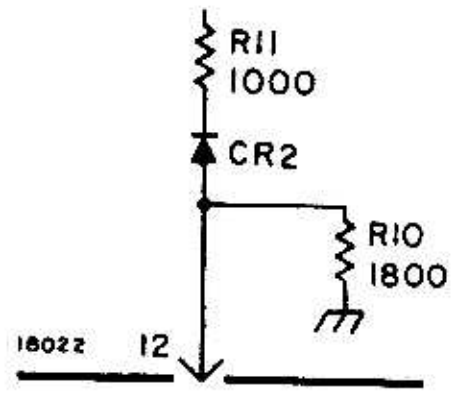
Symbol	Stock No.	Drawing No.	Description
	419027	3457873-501	REGULATOR MODULE-CODE C P/L 3457873-501 REV 17
21C1	231679	3457333-156	TANTALUM, 15MF 20% 20V
21C2	234543	3463453-117	CERAMIC, .01MF +80-20% 25V
21C3	249516	3731187-007	ELECTROLYTIC, 850MF - 10+150% 25VDC
21C4	265248	3457334-105	TANTALUM, 33MF 20% 15V
21C5	226675	3457334-099	TANTALUM, 10MF 20% 15V
21CR1	245479	3731199-012	DIODE-ZENER, 6.8V 10%
21CR2	242522	3464611-001	DIODE
21L1	221425	1219758-001	CHOKE-25UH
21Q1	242758	3468182-001	TRANSISTOR-SILICON, NPN
21Q2	241884	3468183-002	TRANSISTOR-SILICON, PNP
21Q3	243279	3463099-001	TRANSISTOR-SILICON, NPN POWER
21Q4	242758	3468182-001	TRANSISTOR-SILICON, NPN
21R1	113524	99206-067	2700 OHMS 10% 1/4W
21R2	108868	99206-075	12,000 OHMS 10% 1/4W
21R3	218499	99206-074	10,000 OHMS 10% 1/4W
21R4	108871	99206-082	47,000 OHMS 10% 1/4W
21R5	502039	82283-045	39 OHMS 10% 1/2W
21R6	227744	99206-052	150 OHMS 10% 1/4W
21R7	108861	99206-050	100 OHMS 10% 1/4W
21R8	419631	3463187-004	VARIABLE, 2500 OHMS
21R9	108866	99206-066	2200 OHMS 10% 1/4W
21R11	108865	99206-062	1000 OHMS 10% 1/4W
21R12	108865	99206-062	1000 OHMS 10% 1/4W
	228124	3450797-003	CONTACT-PIN, .093 DIA., PKG QTY OF 5
	232359	3464510-002	REGULATOR TRANSISTOR-MOUNTED EXTERNAL TO THE REGULATOR MODULE - NOT PART OF P/L 3457873-501
	240143	3464424-001	SOCKET FOR REGULATOR TRANSISTOR

TK 269

PRODUCTION VARIATIONS

The production level of the module is indicated by a legend (example: CODE C) stamped on the module near the identifying drawing number. The following table lists the differences between the various production levels. To determine the difference between a given production level and the level shown on the pathfinder, schematic, and parts list, note the differences tabulated for the desired level and all subsequent levels.

REGULATOR MODULE
Current Version: 3457873-501 CODE C

Code Level Differences	Instruction Book References	Changes for Code-Level Differences			
A - B	Component Values	Symbol	Stock No.	Drawing No.	Description
		21C3	233576	3464636-002	Electrolytic, 1000 uFD, 16V
		21R10	219460	99206-065	1800 ohms, 10%, 1/4W
		21R11	106865	99206-062	1000 ohms, 10%, 1/4W
	Schematic	Circuit between CR2 and pin 12 is: 			
B - C	Component Values	Symbol	Stock No.	Drawing No.	Description
		21C2	224570	8982805-002	Ceramic, 0.01 uFD, 100V
		21C4	218772	3457333-105	Tantalum, 33 uFD, 15V

EMERGENCY SUBSTITUTES-SOLID STATE DEVICES

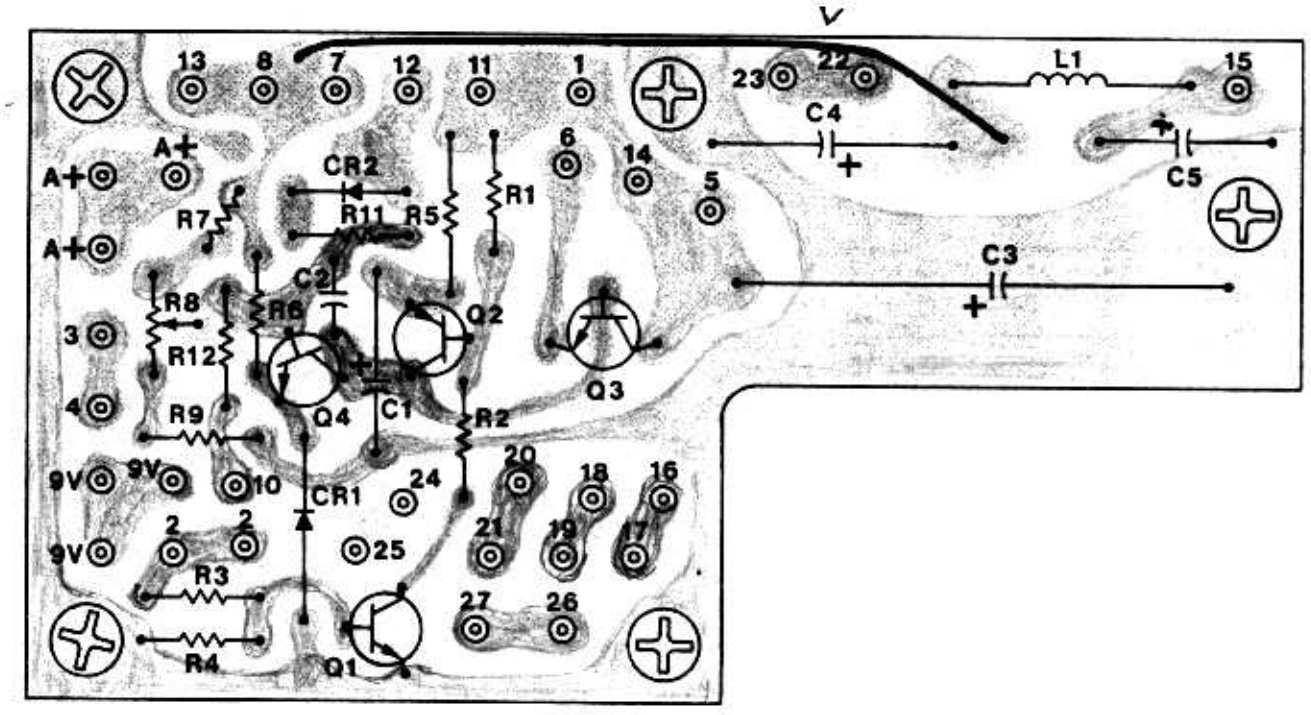
In the event of a semiconductor failure, the exact replacement found in the replacement parts list should be used. In an emergency, to minimize equipment downtime, the following common semiconductor types may be temporarily used. However, use of these substitutes may result in degraded system performance.

Component Designation	Emergency Substitute
21CR1	Zener, 6.8V, 1 watt
21CR2	1N914
21Q1	2N4123

Component Designation	Emergency Substitute
21Q2	2N4126
21Q3	2N3053
21Q4	2N4123

21 3457873-501
REGULATOR MODULE, Part of Power Amp Chassis

3472749 02

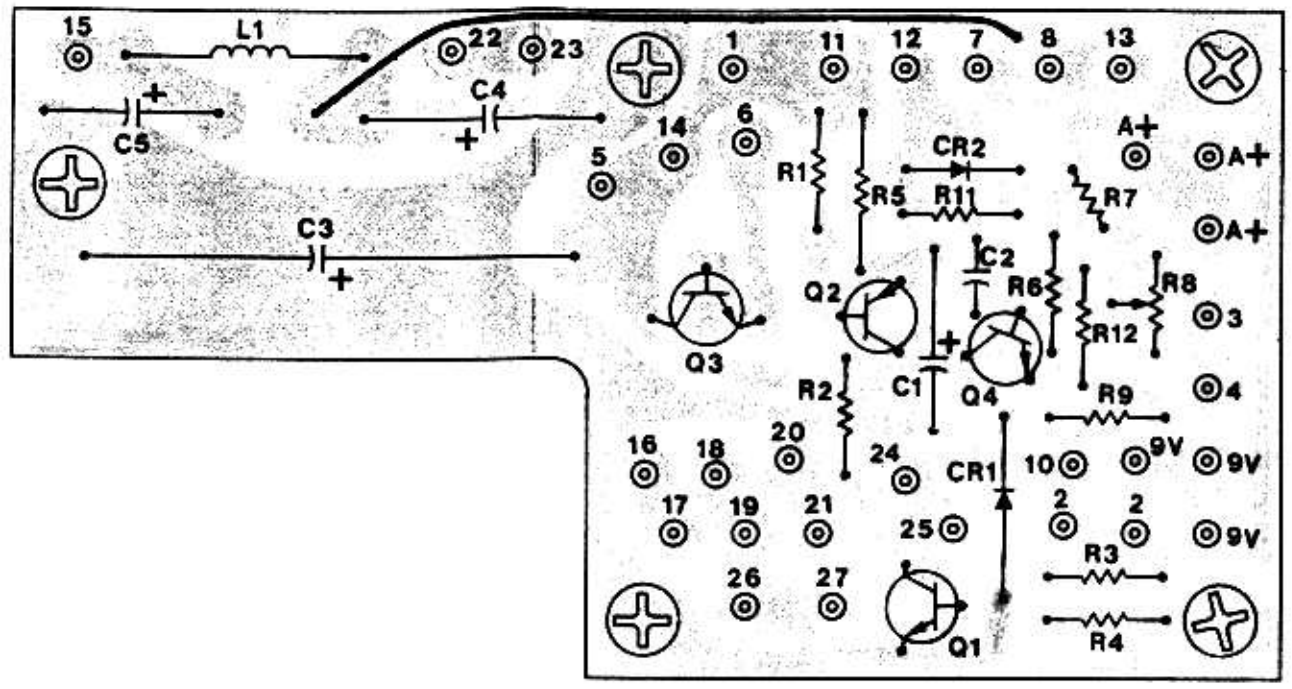


38023

AS SHOWN ON FOIL SIDE OF BOARD

NOTES

1. All resistor values are in ohms, 10%, 1/4 watt, except as noted.
2. All capacitor values are in microfarads, except as noted.



38036

AS SHOWN ON COMPONENT SIDE OF BOARD