21178

NAVSHIPS 0967-292-9032

CHANGE NOTICE

CHANGE NO. 2
1 MAY 1971
TO

NAVSHIPS 0967-292-9030

TECHNICAL MANUAL
FOR
MD-777/FRT
MODULATOR-SYNTHESIZER

The Technical Manual for Modulator-Synthesizer MD-777/FRT is changed as follows:

NEW PAGE		OLD PAGE	
TP/ii	Ch. 1/Ch. 1	TP/ii	Orig/Orig
ii.1/Blank	Ch. 2/Blank	Added	
vii/viii	Ch. 2/Ch. 2	vii/viii	Orig/Orig
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4-115/4-116	Orig/Ch. 2	4-115/4-116	Orig/Orig
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6-111/6-112	Ch. 2/Ch. 2	Added	

1. This change revises the Technical Manual to reflect the as-built Production Equipment.

2. The old pages should be removed and discarded and the new pages inserted.

3. This Change Notice should be filed just after the title page.

NAVSHIPS 0967-292-9030

VOLUME 3

TECHNICAL MANUAL

for

MODULATOR-SYNTHESIZER MD-777/FRT

Used with:

AN/FRT-83(V) 1 KW HF ISB TRANSMITTER
AN/FRT-84(V) 10 KW HF ISB TRANSMITTER
AN/FRT-85(V) 40 KW HF ISB TRANSMITTER
AN/FRT-86(V) 200 KW HF ISB TRANSMITTER

DEPARTMENT OF THE NAVY
NAVAL ELECTRONIC SYSTEMS COMMAND

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LIST OF ILLUSTRATIONS (Cont)

LIST OF ILLUSTRATIONS (Cont)

(e) READY. - The READY indicator (green lamp) lights following completion of the transmitter system tuning cycle. This action informs the operator that the system is tuned to the frequency established by the setting of the FREQUENCY KC tuning dials.

(3) INPUT LEVEL AND CIRCUIT TEST METERS. - Two front panel meters allow monitoring the signal levels at the four audio input channels and checking exciter operation at selected circuit test points. Each meter circuit has a switch for selecting the function to be monitored.

(a) INPUT LEVEL. - The INPUT LEVEL monitoring circuit contains the panel VU meter and an audio channel selection switch. When the switch is in the OFF position, the meter is disconnected from the input circuits. In the other switch positions, audio levels are monitored at sideband channels B2, B1, A1, and A2, respectively.

(b) CIRCUIT TEST. - The CIRCUIT TEST panel section contains a test meter and selector switch for checking exciter operation at major circuit points. These tests include measurement of various dc power supply voltages and rf injection frequencies, and a check on the operation of control circuits such as the automatic level control (ALC), average and peak power control (APC and PPC), and the transmitter gain control circuit (TGC). A relative measurement is made of the exciter rf power output level. In addition, the panel meter is used as a "null" indicator for calibration of the internal 1 mc frequency standard with the external standard.

To indicate acceptable meter readings for most measurements, a central section of the meter scale is colored green. Those switch positions using this colored section are identified with a green band on the panel. Unmarked switch positions represent measurements which provide acceptable readings outside of the green scale section. Table 3-4 lists the selector switch positions, identifies the particular exciter circuit to be checked, and gives the required meter reading for acceptance.

e. NONOPERATING CONTROLS. - The following controls are not located on the exciter front panel but are accessible on the auxiliary panel, following withdrawal of the exciter drawer from its enclosure. They are intended for use by technicians for adjusting and calibrating the unit and should be adjusted by a qualified technician only. Figure 3-1 shows control locations.

(1) TEST A/B. - A three-position toggle switch used during initial performance tests to override system control circuits and place the exciter in operation independent of the remaining system units.

(2) PWR CONTROL. - A potentiometer adjustment for setting the level of maximum rf power output.

(3) NORMAL/FAULT OVRD. - A toggle switch for overriding the "fault" indicator circuits to determine location of malfunction.

(4) METER ADJ. - A potentiometer adjustment for calibrating the INPUT LEVEL VU meter 0-dbm reading.

(5) FREQ STD. - A potentiometer adjustment for calibrating the 1 mc internal frequency standard. Equipped with a ten-turn dial for logging adjustments made.

(6) INPUT LEVEL -dbm. - Four controls for adjusting audio input levels at the B2, B1, A1, and A2 channels. Dial scales are calibrated from -30 to +10 db. When used with the INPUT LEVEL VU meter reading, the algebraic sum of the control and meter readings equals the audio channel level.

(7) ON/OFF MOD. - Toggle switch to remove modulation from the exciter rf output for test purposes.

TABLE 3-4. CIRCUIT TEST MEASUREMENTS

SWITCH POSITION	CIRCUIT TESTED	METER READING REQUIRED
POWER SUPPLY		
+5 V	+5 volt dc power supply	Within red scale section
+15 V	+15 volt dc power supply	Within red scale section
+24 V	+24 volt dc power supply	Within red scale section
-12 V	-12 volt dc power supply	Within red scale section
+125 V	+125 volt dc power supply	Within red scale section
RF LEVELS		
1.74371 MC	Sidetone, channel A2	Within green scale section
1.75 MC	Sidetone, channels A1, B1	Within green scale section
1.75629 MC	Sidetone, channel B2	Within green scale section
113.75 MC	Up-converter input	Within green scale section
82 - 110 MC	Down-converter injection	Within green scale section
POWER OUTPUT	Exciter rf output	Depends on set level
CONTROL		
PPC/APC	Peak/average power control	Depends on system operation
TGC	Transmitter gain control	Depends on operation
A2-ALC	Level control, channel A2	Depends on operation
A1-ALC	Level control, channel A1	Depends on operation
B1-ALC	Level control, channel B1	Depends on operation
B2-ALC	Level control, channel B2	Depends on operation
"NULL" METER		
FREQ STD LOCK	Calibration, 1 mc standard with external standard	(One beat in 30 seconds is a frequency correlation of 0.3 cps)

waves to drive the base of amplifier Q6. The 1 mc output from Q6 is applied to side carrier generator module A9 and 1.75/113.75 mc generator module A8.

If the 1 mc internal standard signal level drops 3 db or more, because of a circuit malfunction, Q2 becomes cut-off and in turn cuts off Q5. This action places a high at gate input Z2-12, driving output Z2-11 low. This low at gate input Z2-10 (and also at gate inputs Z2-2 and Z1-12) opens the 1 mc internal standard circuit to the base of amplifier Q6, effectively disconnecting the internal standard.

The 1 mc external standard signal at the base of buffer Q3 appears at gate input Z1-4, via bias diode CR2. The negative signal alternation at the gate input produces a 1 mc square wave (high) at output Z1-6, driving input Z2-5 high. Since gate input Z2-4 is already high (when the internal standard level dropped, it placed a low at gate input Z2-2 to drive output Z2-3 high), the 1 mc output from gate Z2-6 now drives the base of amplifier Q6. In this manner, a 1 mc standard frequency is maintained at the output of Q6 from either the internal or external frequency standard, to assure a continuation of exciter operation in the event of circuit failure in the internal standard.

When the 1 mc internal standard signal level returns to normal, Q2 and Q5 again become saturated, driving gate outputs Z2-8 and Z2-11 high as before. The internal standard replaces the external standard and the automatic switching cycle is completed. Although a 3 db drop in level is necessary to substitute the internal standard signal with that from the external standard, a resubstitution will not occur until the internal standard level rises to within 1.5 db of normal level. This switching cycle overlap assures reliable circuit operation and immunity from the affects of circuit noise. Resistor R11 at gate input Z2-10 provides the overlap. Prior to initiation of a switching cycle, Q2 and Q5 are saturated and gate output Z2-11 is high. The gate output voltage, via resistor R11, is superimposed on the base bias voltage of differential amplifier Q4 to set the initial 3 db "trip" point. When switching has been accomplished and the external standard is in use, Q2 and Q5 are cut-off and gate output Z2-11 is low. Consequently, the trip point is determined by the adjustment of control R10 only, and the internal standard is resubstituted when its output level is 1.5 db below normal rather than at the 3 db "drop-out" level.

Although not intended for use in this equipment, provisions have been incorporated in the standard selector circuit for manual rather than automatic selection of the frequency standard in use. If terminal 16 at resistor R2 is grounded, thus grounding gate input Z2-13, gate output Z2-11 will go high and select the internal standard. If terminal 4 at resistor R1 is grounded, thus grounding gate input Z1-12, gate output Z2-11 will also be grounded (a low) and select the external standard.

(b) FAILURE ALARM CIRCUIT. - When frequency standard switching is initiated, following a drop of 3 db in the internal standard output level, gate output Z2-11 goes low and effectively grounds gate input Z1-12. Gate output Z1-11 goes high to drive buffer amplifier Q7 and operate the failure alarm circuit at the output of Q7. This action lights the STD FAIL indicating lamp on the exciter front panel, and also other STD FAIL indicators present in the transmitting system. Upon return of the internal standard to operation, accompanied by a high at gate input Z2-11, gate input Z1-12 goes high to drive output Z1-11 low. This extinguishes the STD FAIL lamp and opens the failure alarm output circuit.

(c) PHASE DETECTOR CIRCUIT. - The phase detector circuit receives a portion of the internal standard output at gate input Z1-9 via gate Z1-3, and a portion of the external standard output at gate input Z1-10 via gate Z1-6. This section of quad gate Z1 serves as a digital phase-detector and provides a square wave output voltage at gate output Z1-8 which is a function of the phase relation between the two frequency standard signals. Resistor R12 and capacitor C5 integrate the gate output to obtain a dc voltage level which is proportional to the square wave duty cycle.

The CIRCUIT TEST selector on the front panel, when placed in the FREQ STD LOCK position, connects the associated panel meter to a null indicating circuit. The "beat" meter

indications occur at a rate which is relative to the phase coincidence between the two frequency standards, and are used to calibrate the internal standard against the external standard.

(2) 3/5/30 MC GENERATOR CIRCUIT. - The 3, 5 and 30 mc generator circuit contains a 30 mc phase-locked oscillator A7A2, frequency dividers and a phase detector circuit (A7A3) and a frequency divider located on A7A1.

The circuit consists of a voltage-controlled 30 mc oscillator, a three stage digital frequency divider (÷2, ÷5, and ÷3), and a phase detector. These circuits are connected in a conventional phase-locked-loop configuration.

A 1 mc reference signal for the phase detector is supplied from the frequency standard via incidental filter and amplifier circuits in 115/113.75 generator A8A2. The comparison 1 mc signal for the phase detector is developed by dividing the 30 mc output of the oscillator by 2 to obtain 15 mc, by 5 to obtain 3 mc and then by 3 to obtain 1 mc. The dc output of the phase detector is used as the control signal for the voltage-controlled 30 mc oscillator, as is common with phase-locked oscillators.

An output of the divide-by-two circuit of the phase-lock loop is taken as the 15 mc output and is supplied to the divide-by-three circuit in A7A1 to obtain the 5 mc output for 1.75/113.75 generator A8. An output from the divide-by-five circuit is taken as the 3 mc output and is supplied to synthesizer module A12.

Three 30 mc outputs are provided by buffer amplifier circuit A7A2; two as source-frequency signals to synthesizer A12, and one to X4 frequency multiplier A18Z1. The resultant 120 mc output of the X4 multiplier is supplied to the 113.75 mc frequency generating circuits (A8A1) of 1.75/113.75 mc frequency generator A8.

b. PRELIMINARY CHECK. (See figure 5-66.) - Make a preliminary check of the auxiliary frequency generator before trouble shooting, with emphasis on the following:

(1) Seating of plug-in module in its socket.

(2) Soldered connections to socket.

c. TEST EQUIPMENT. - Use Electronic Multimeter AN/USM-116 and Frequency Counter H-P 5245L with Frequency Converter H-P 5253A. No special tools required.

d. CONTROL SETTINGS. - Preset all controls as indicated in table 3-1. (Place exciter in "operate" condition.)

e. TEST DATA. (See figure 5-66.) - Trouble shooting the auxiliary frequency generator consists of checking the +5 and +15 volt dc operating potentials and measuring the output frequencies at chassis connector A18XA7.

(1) Connect multimeter to XA7 pin K. Meter should read +5 vdc ±5%.

(2) Connect multimeter to XA7 pin P. Meter should read +15 vdc ±5%.

(3) Connect frequency counter to XA7 pin F. Counter should read 1.000000 ±1 count.

(4) Connect frequency counter to XA7 pin U. Counter should read 30.000000 mc ±1 count.

(5) Connect frequency counter to XA7 pin V. Counter should read 30.000000 mc ±1 count.

(6) Connect frequency counter to XA7 pin X. Counter should read 30.000000 mc ±1 count.

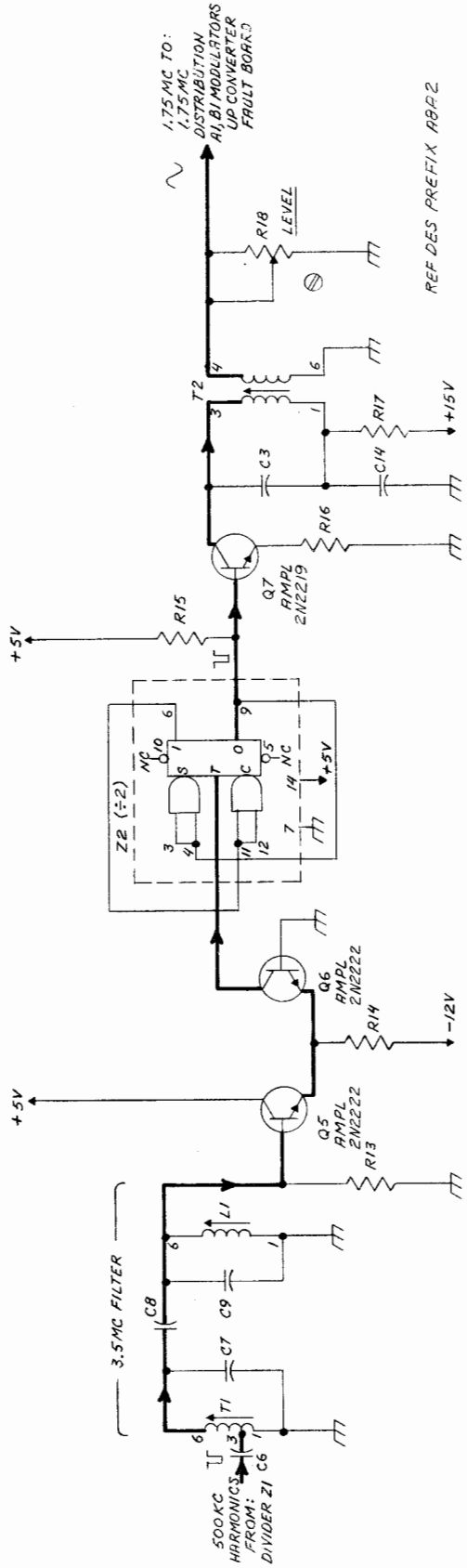


Figure 4-8. 1.75 Mc Frequency Divider, Simplified Schematic Diagram

FD1-4-7

R17 establishes the level of the 1.75 mc injection frequency applied to the channel A1 and B1 modulators (A2 and A3).

(2) 113.75 MC FREQUENCY GENERATOR A8A2. (See figure 4-9.) - The 113.75 mc frequency generator contains a frequency multiplier-divider circuit (Q1, Q3, Q4, Z1, and Z2) which produces a 6.25 mc output frequency from a 5 mc input frequency. The multiplier-divider is followed by phase detector Z4 and dc amplifier Q10, Q12. The phase detector output is used to control the frequency of 113.75 mc VCO, Q11. The 113.75 mc frequency generator also contains a 120 mc amplifier and mixer circuit (Q2, Q5, and Z3) and the oscillator buffer-amplifier (Q8 and Q9).

(a) 6.25 MC MULTIPLIER AND 120 MC AMPLIFIER. (See figure 4-10.) - A 5 mc square-wave input signal from auxiliary frequency generator (A7) is applied to the base of X5 frequency multiplier Q1 and appears as a 25 mc frequency at transformer T1. The double-tuned circuit consisting of L1 and C6, and the primary of transformer T1 and capacitor C8, selects the 25 mc component at the collector of Q3. Capacitor C7 provides coupling between the two tuned circuits. Output from T1 is passed through a complementary amplifier formed by Q3 and Q4, and is reduced to 6.25 mc by divide-by-four frequency divider Z1 and Z2. The 6.25 mc square-wave output from Z2 is amplified by Q6 and applied to one input of phase detector Z4. Gated flip-flops Z1 and Z2 have an internal J-K connection for operation as digital frequency dividers.

A 120 mc frequency supplied by X4 multiplier A18Z1 is applied to the input of cascode amplifier Q2 and Q5. The primary of transformer T2 at the collector of Q5 is tuned to 120 mc by capacitor C11, and the 120 mc frequency at the transformer secondary is passed through a resistive attenuator to one input of mixer Z3.

(b) 113.75 MC VCO AND PHASE LOCK LOOP. - Voltage controlled oscillator (VCO) Q11 is arranged in a modified Colpitts circuit. Tank inductor L4 is tuned by series capacitors C34 and C35. Varactor CR3, in parallel with tuning capacitor C35, controls the oscillator frequency over a narrow tuning range in response to a dc varactor control voltage applied via resistor R50. Phase detector Z4 develops the control voltage which is amplified by the direct-coupled stages Q10 and Q12. VCO output goes to up-converter A11 via emitter follower Q13. To limit the varactor control voltage range, and therefore the VCO frequency range, a fixed dc voltage is applied to varactor CR3 through resistor R49 which forms a voltage divider with R48. Consequently, the minimum value of control voltage, corresponding to the lowest VCO frequency, is determined by the fixed supply voltage.

A tuned low-pass filter (consisting of C21, C25, C26 and L3) in the output circuit of phase detector Z4 rejects unwanted frequency components of the dc control signal.

Ramp generator CR2, in conjunction with the RC circuit R41, R43, and C32, generates a dc ramp voltage at the base of Q12 for effective VCO control. Normally the dc ramp does not repeat during circuit operation but rises when the circuit is initially energized until the VCO locks at an appropriate ramp level. Capacitor C32 is charged at a relatively slow rate from the +15 volt dc supply circuit through resistor R43 via Q10 collector load resistor R41. When the VCO locks, the dc operating level of Q10 stabilizes to hold the charge of C9 at that point of the dc ramp. In the event of nonlocking, the charge at C9 continues to rise until it equals the conduction threshold of CR2, and C9 discharges immediately to ground through CR2. In this instance only, the ramp generation cycle is repeated.

VCO locking is performed by a phase-lock loop consisting of amplifier stages Q8 and Q9, mixer Z3, amplifier Q7 with transformer T3, and phase detector Z4. A sample of the VCO output frequency is amplified by Q8 and Q9, and applied as the second input frequency to mixer Z3. There, the 113.75 mc VCO frequency is mixed with the standard 120 mc frequency (from the 120 mc amplifier circuit) to obtain a 6.25 mc frequency at the mixer output. Amplifier Q7 applies the mixer output frequency to phase detector Z4 via transformer T3, where it is compared with the standard 6.25 mc frequency developed by the 6.25 mc multiplier

The emitter circuit of Q1 contains a gain control network formed by varactor CR1, capacitor C4, and inductor L1, arranged to control the degree of emitter by-passing and, therefore, the gain of Q1. Inductor L1 and varactor CR1, in series with capacitor C4, form a 112 mc tuned circuit between emitter bypass capacitor C5 and ground. Consequently, the bypass effectiveness of C5 is a function of the tuned circuit impedance. This impedance is maximum with the tuned circuit resonant, dropping rapidly as varactor CR1 detunes the circuit in response to the dc varactor-control (AGC) voltage. At resonance, the high tuned-circuit impedance effectively opens the C5 ground circuit causing emitter circuit degeneration and reducing amplifier gain. Off resonance, the tuned circuit impedance is low and C5 effectively bypasses the emitter circuit to increase the stage gain. Inductor L2 functions as a parasitic suppressor.

(2) MIXER A13Z1. - Down-converter mixer is a sealed component. The 112 mc frequency from 112 mc i-f amplifier A13A2 is mixed with the 82 to 110 mc injection frequency from 82 to 110 mc amplifier A13A3 to obtain a 2.0 to 30.0 mc (actually 29.9999 mc) mixer output frequency range. Essentially, the mixer uses a balanced demodulator circuit with balun transformers in the main input and output circuits for coupling to the unbalanced (grounded) circuits involved.

(3) 82 TO 110 MC AMPLIFIER A13A3. - The 82 to 110 mc buffer amplifier consists of input stage Q1, emitter follower Q2, and output stage Q4. It also includes level detector/amplifier Q3 which is driven from the emitter of amplifier Q4. An 82 to 110 mc range of frequencies supplied by synthesizer A12 is applied to the base of Q1 through a resistive attenuator (R1, R2, and R3) which has approximately a 6 db insertion loss. Output from the collector of Q1 passes through emitter follower Q2 and drives the base of output amplifier Q4. Output at the collector of Q4 is applied to mixer A13Z1 to serve as the injection frequency. The dc level from detector Q3 is applied to fault monitor board A18A2.

b. PRELIMINARY CHECK. (See figure 5-79.) - Make a preliminary check of the down-converter before trouble shooting, with emphasis on the following:

(1) Seating of plug-in module in its socket.

(2) Soldered connections at socket.

c. TEST EQUIPMENT. - Use Electronic Multimeter AN/USM-116 and Frequency Counter H-P 5245L with Frequency Converter H-P 5253A. No special tools required.

d. CONTROL SETTINGS. - Preset all controls as indicated in table 3-1. (Place the exciter in "operate" condition.) Make sure CLASS OF EMISSION switch is in A0 position.

e. TEST DATA. (See figure 5-79.) - Trouble shooting the down-converter circuits consists of checking the +18, and +24 volt dc operating potentials and measuring the input and output frequencies. All measurements are made at chassis connector A18XA13.

(1) Connect multimeter to XA13 pin M. Meter should read 0 to +5 vdc.

(2) Connect multimeter to XA13 pin T. Meter should read +24 vdc ±10%.

(3) Connect frequency counter with converter to XA13 pin A. Counter should read 112.00000 mc ±1 count.

Note

Check that FREQUENCY KC tuning dials are set at 02000.0 kc before performing the measurements in steps (4) and (5).

(4) Connect frequency counter with converter to XA13 pin X. Counter should read 110.00000 mc ±1 count.

(5) Connect frequency counter (only) to XA13 pin P. Counter should read 2000. 0000 kc ±1 count.

4-11. OUTPUT AMPLIFIER A16. (See figures 4-44 and 5-82.)

The rf output amplifier module contains preamplifier A16A1 and three-stage push-pull rf amplifier A16A2. An output termination circuit containing muting relay K1 and meter rectifier CR1 is located on A16A1 for level monitoring. Faulty operation of these circuits can adversely affect the exciter power output level or prevent exciter unit operation completely.

a. DESCRIPTION. - The rf output amplifier is a linear broadband amplifier for the frequency range from 2.0 to 30.0 mc. It raises the level of carrier signal from down-converter module A13 to produce 250 milliwatts of rf power (PEP), into a 50-ohm exciter output termination. A muting relay circuit is incorporated to remove exciter output power for system "key up" conditions. A meter rectifier and filter circuit permits measurement of the output amplifier level by the CIRCUIT TEST meter on the exciter control panel.

(1) PREAMPLIFIER A16A1. - A 2.0 to 30.0 mc (29.9999 mc) carrier frequency from down-converter A13 is passed through input filter FL1 to the base of preamplifier Q1. The filter is an 11-pole Chebysheff having a 35 mc cut-off frequency and an attenuation of 66 db-per-octave, to effectively remove 82 to 110 mc injection frequencies present in the down-converter output. Preamplifier Q1 raises the signal level prior to application at the input of rf amplifier A13A2.

(2) RF AMPLIFIER A16A2. - The 2.0 to 30.0 mc signal from preamplifier A13A1Q1 is applied to phase splitter Q1 via coupling capacitor C2. The phase splitter output drives push-pull amplifiers Q2 and Q3 through capacitors C4 and C5. Transformer T1, in turn, drives a second push-pull stage using emitter-followers Q4 and Q5. Emitter follower output is directly connected to the bases of the last push-pull amplifier, Q8 and Q9, and rf output is obtained from output transformer T2. Inductors L2 and L3 serve as the base load impedance for Q2 and Q3, and inductor L7 performs a decoupling function in the -12 volt dc supply circuit to the emitters of Q6 and Q7.

Stages Q6 and Q7 function as dc rather than rf amplifiers and serve as a constant current source for the emitter circuits of Q4 and Q5, respectively, to maintain a constant emitter-current supply during the rf drive excursions at the bases of Q8 and Q9. Capacitors C12 and C17, and C18 and C19, bypass the rf components at the base and emitter circuits of Q6 and Q7. Rf output from transformer T2 is applied to the muting relay and meter rectifier circuit.

(3) MUTING RELAY AND METER RECTIFIER. - The muting relay and meter rectifier are located on module A16A1. Output from rf amplifier A16A2 is applied through balun transformer T1 and a resistive attenuator (R7 through R9) to muting relay K1. Balun T1 provides an unbalanced (grounded) output termination with a 50-ohm impedance. When de-energized, relay K1 supplies rf output power to RF OUT connector A19J1 on the exciter rear panel, via relay contacts b2, b3, and a2, a3. When relay K1 is energized, during a system "key-up" operating condition, rf output is disconnected from the RF OUT connector and terminated at load resistor R12. For normal operation attenuator R7 through R9 inserts a 1 db attenuation. For "key-up" conditions, the attenuator maintains a stable 50-ohm load in conjunction with load resistors R12 and R13. Diode CR2 at relay K1 functions as an arc suppressor.

A portion of the rf output is applied to meter rectifier CR1 via divider resistors R10 and R11. A low pass filter consisting of inductor L5 and resistor R14, with capacitors C12 through C15, removes rf components from the resultant dc voltage which is applied to the CIRCUIT TEST meter when the test switch is set at POWER OUTPUT. A divider formed by resistors R16 and R17 supplies a reduced portion of the rf output to front panel RF OUTPUT MONITOR connector A18J1.

Detail C shows the waveforms associated with NAND gate Z6-6 operation. Note that the gate inputs are a duplicate of the gate Z6-8 inputs, with exception of the 125 kc substitution for 125 kc at Z6-4 and the addition of a 5 kc and 2.5 kc input (combined) via diodes CR1 and CR2 at Z6-3. Both phases of the 500 kc and 125 kc input frequencies are employed to obtain all of the combinations required for development of a 4 kc frequency.

Detail D shows the rate multiplier "wired OR" summing process with a 4 kc pulse added to the previous 625 kc frequency summation to obtain a 629 kc frequency. The 5 kc output at gate Z6-6 is buffered by gate Z1-8 and applied to the input of NAND gate Z1-6 together with a 1 kc frequency from the divide-by-1000 circuit. Output at gate Z1-6 is a 5 kc frequency "blanked out" every fifth pulse to obtain a 4 kc rate. Blanking is accomplished by the 1 kc frequency which inhibits gate Z1-6 after each group of four 5 kc pulses. Output from the rate multiplier circuit is applied to the divide-by-100 circuit section for frequency reduction to 6.29 kc.

(c) DIVIDE-BY-100 CIRCUIT. (See figure 4-12.) - The divide-by-100 circuit consists of two divide-by-5 binary counters using flip-flops Z10, Z12, Z14, and Z16, Z18, Z19, respectively; divide-by-2 J-K flip-flop Z20; a 12.58 kc bandpass filter and amplifier with Q1 and Q2; and divide-by-2 J-K flip-flop Z21. Total frequency division from 629 kc to 6.29 kc is accomplished in division steps of 5, 5, 2, and 2.

A 629 kc frequency from the rate multiplier circuit is reduced to 125.8 kc and then to 25.16 kc by the two divide-by-5 binary counters. J-K flip-flop Z20 performs an additional division-by-2 to obtain a 12.58 kc frequency which is applied to a double-tuned bandpass filter consisting of tuned circuits L1, C4, and L2, C6. The filter rejects spurious frequency components contributed by the rate multiplier circuit and supplies a 12.58 kc sine wave to compound emitter-follower stage Q1 and Q2. This stage offers a high impedance input to the filter circuit and reduces tuned circuit loading. A final frequency reduction to 6.29 kc is performed by J-K flip-flop Z21 which also performs a waveform squaring function to obtain a 6.29 kc square wave signal. Output from Z21 is applied to side-carrier generators A9A2.

(2) SIDE-CARRIER GENERATORS A9A2. (See figures 4-45 and 5-68.) - The side-carrier generator circuit contains two individual voltage-controlled crystal oscillators for the generation of 1.756290 and 1.743710 mc side-carrier frequencies. Each crystal oscillator is indirectly phase locked to the 1 mc standard frequency by comparing their output frequencies with the 250 kc and 6.29 kc frequencies derived from the 1 mc standard frequency. Both frequency generators employ a voltage-controlled crystal oscillator (oscillating at two times the output frequency); buffer amplifiers; a divide-by-two circuit; an output stage with a bandpass filter; and a phase locked loop consisting of a buffer amplifier, a digital mixer, a differential amplifier and a 6.29 kc chopper stage. Because the two oscillator circuits are identical except for the crystal frequency, descriptions in the following paragraphs for the 1.756290 mc circuit also apply to the 1.743710 circuit.

Basically, the frequency of crystal oscillator Y1 (3.512580 mc) is corrected by a dc control voltage applied to the varactor control circuit of CR1. Control voltage is supplied by differential amplifier Q1 and Q2 via chopper Q5 which samples the voltage at a 6.29 kc rate. The differential amplifier is driven by a digital mixer using NAND gates Z1-11 and Z2-11, and a sample of the output frequency is combined with the two out-of-phase 250 kc input frequencies at the mixer. Any change in oscillator frequency is corrected by a change in level of the chopper output.

(a) DIGITAL MIXER. - The digital mixer consists of dual-input NAND gates Z1-11 and Z2-11, and output integrating networks R1, C6 and R9, C9. Gate output pulses drive the base elements of differential amplifier Q1, Q2. A 250 kc (logical "1") frequency at gate input Z2-13, and a 250 kc (logical "0") frequency at gate input Z1-13 are combined with a sample of the output frequency (1750 kc, nominal) applied to gate inputs Z1-12 and Z2-12 from buffer gate Z1-3. The (nominal) 1750 kc output frequency is the seventh harmonic of the 250 kc input frequencies, and the digital mixer output contains conventional sum and difference mixer products. Consequently, for the (actual) output frequency 1.756290

mc (1756.290 kc), the gate outputs will contain a 6.29 kc component representing the beat-frequency difference between with the 250 kc seventh harmonic (1750.000 kc - 1756.290 kc = 6.29 kc). Because the two 250 kc input frequencies are 180 degrees out-of-phase, the related gate outputs will also be out of phase.

The 6.29 kc component is applied via integrating networks R1, C6 and R9, C9 to differential amplifier Q1 and Q3. The output of the differential amplifier is a 6.29 kc frequency which is applied to chopper stage Q5. C12 gives additional filtering of higher frequency components. R1 balances the input to the differential amplifier Q1 and Q3 to obtain maximum output swing at Q1 collector.

(b) CHOPPER CIRCUIT. - The chopper circuit consists of dual-emitter chopper Q5 and a pulse shaper using dual-input NAND gates Z2-10 and Z2-9. A 6.29 kc frequency from divider circuit A9A1 is directly applied to gate input Z2-10, and applied via integrating circuit R10 and C10 to gate input Z2-2. Output from gate Z2-8 is a narrow pulse which occurs only during the time overlap period of the two input pulses. The integrating circuit delays the gate input Z2-2 pulse to produce the overlapping. The 6.29 kc "sampling" pulse triggers chopper Q5 via transformer T1.

The chopper functions as a phase detector, and the chopper output level is determined by the phase relation between the 6.29 kc component from differential amplifier Q1, Q2, and the fixed 6.29 kc chopping frequency. A decrease in oscillator frequency will increase chopper output, and the higher charge at capacitor C14 will increase and correct the oscillator frequency. Conversely, an increase in oscillator frequency will reduce the chopper output and decrease the oscillator frequency. In this manner, crystal oscillator Y1 is "locked" to the absolute 6.29 kc "sampling" frequency.

(c) VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR AND DIVIDE-BY-TWO CIRCUITS. - The varactor-controlled crystal oscillator consists of Q7, C16, C17, 3.512580 crystal Y1, and varactor CR1. Oscillator output is applied via buffer amplifier Q8 and Q11 to divide-by-two flip-flop Z4. The output of Z4 (1.756290 mc) is applied to buffer Z1. One output, Z1-6, is applied to buffer Z1-2; the output at Z1-3 is applied to the digital mixer. The second output, Z1-8, is applied to the output amplifier. Dc control voltage from chopper circuit capacitor C14 is applied to the varactor to "pull" the oscillator frequency, over a small frequency range, and thereby control and correct the frequency.

(d) 1.756290 MC OUTPUT AMPLIFIER. - Amplifier Q13 receives the 1.756290 mc output from buffer (NAND) gate Z1-8 and raises the signal level. Potentiometer R42 sets the side-carrier level applied to the B2 channel modulator circuit (A1). The primary of output transformer T3 is tuned to 1.756290 mc by capacitor C22, and the resultant sine-wave signal goes through an attenuator, formed by resistors R46, R48, and R50, which also provides a 50-ohm output termination impedance for the amplifier. The 1.743710 mc side-carrier generator circuit is identical to the 1.756290 generator, with the exception of the frequency of Y2, which is 3.487420 mc.

b. PRELIMINARY CHECK. (See figure 5-68.) - Make a preliminary check of the side-carrier generator before trouble shooting, with emphasis on the following:

(1) Seating of plug-in module in its socket.

(2) Soldered connections at socket.

c. TEST EQUIPMENT. - Use Electronic Multimeter AN/USM-116 and Frequency Counter H-P 5245L. No special tools required.

d. CONTROL SETTINGS. - Preset all controls as indicated in table 3-1. (Place the exciter in "operate" condition.)

e. TEST DATA. (See figure 5-68.) - Trouble shooting the side-carrier generator consists of checking the +5 and +15 volt dc operating potentials, and measuring the input and output frequencies. All measurements are made at chassis connector A18XA9.

TABLE 4-7. LPA TUNING CODE

CHAN. NO.	SEGMENT FREQUENCY (MC)	STEP	TUNING DIALS			5-WIRE CODE	RELAYS ENERG.
			10 MC	1 MC	100 KC		
1	02.0 - 02.4	400 KC	11	1000	001 to 010	00001	K2, 4, 5
2	02.5 - 02.9	400 KC	11	1000	110 to 100	00011	K2, 5
3	03.0 - 03.4	400 KC	11	0000	001 to 010	00111	K2, 3
4	03.5 - 03.9	400 KC	11	0000	110 to 100	01111	K3, 5
5	04.0 - 04.9	900 KC	11	1001	001 to 100	11110	K1, 3
6	05.0 - 05.9	900 KC	11	0001	001 to 100	11101	K1, 3, 4, 5
7	06.0 - 06.9	900 KC	11	1011	001 to 100	11011	K1, 5
8	07.0 - 07.9	900 KC	11	0011	001 to 100	10111	K1, 2, 3, 5
9	08.0 - 09.9	1.9 MC	11	1110 to 0110	001 to 100	01110	K3
10	10.0 - 11.9	1.9 MC	01	1100 to 0100	001 to 100	11100	K1, 3, 4
11	12.0 - 13.9	1.9 MC	01	1000 to 0000	001 to 100	11001	K1, 4, 5
12	14.0 - 15.9	1.9 MC	01	1001 to 0001	001 to 100	10010	K1, 2
13	16.0 - 17.9	1.9 MC	01	1011 to 0011	001 to 100	00100	K2, 3, 4
14	18.0 - 19.9	1.9 MC	01	1110 to 0110	001 to 100	01001	K4, 5
15	20.0 - 21.9	1.9 MC	01	1100 to 0100	001 to 100	10011	K1, 2, 5
16	22.0 - 23.9	1.9 MC	10	1000 to 0000	001 to 100	00110	K2, 3
17	24.0 - 25.9	1.9 MC	10	1001 to 0001	001 to 100	01100	K3, 4
18	26.0 - 27.9	1.9 MC	10	1011 to 0011	001 to 100	11000	K1, 4
19	28.0 - 29.9	1.9 MC	10	1110 to 0110	001 to 100	10000	K1, 2, 4

"0" = Low, "1" = High

Q5), and the five logic relays (K1 thru K5). When de-energized, relays K1, K4, and K5 produce a logical "1" (ground) while the remaining relays provide a logical "0" (open), a negative logic sequence.

The bits from the 10 mc, 1 mc, and 100 kc tuning dials are applied to the NAND gate integrating circuits directly, or following inversion gates Z1 and Z2. Bit inversion of a logical "1", for example, produces a "$\overline{1}$" (not "1", or "0"). In this manner, the total number of bits applied is doubled to facilitate gate operation. With reference to table 4-7, the 9-bit code for channel 1 (11, 1000, 001 to 010) from the three tuning dials, is converted to the 5-wire code 00001 when relays K2, K5, and K4 are energized. Consequently, the frequency segment from 02.0 to 02.4 mc (encompassing 400 kc) is integrated to form a single tuning channel for the LPA. The remaining 18 channels or segments cover the rest of the tuning range and differ only in the segment width expressed in kilocycles or megacycles. No attempt will be made to present a detailed description of the entire band encoder operations; however, the following paragraph contains a description of the W1 circuit which is similar in operation to the other 5-wire circuits, W2 through W5.

(a) W1 ENCODER CIRCUIT. (See figure 4-30.) - The band encoder circuit for wire 1 (W1) of the five-wire output code is shown in figure 4-30. Although NAND gates Z1, Z2, Z6, and part of Z10 are actually used (see figure 4-29), in the functional diagram designations Z1 through Z9 are used for simplicity and to clarify the tables in details A, B, and C.

Detail A is a truth table for the 3-input NAND gates, using positive logic terminology. Output at gate terminal 4 is a "1" for all input states except the coincidental "1" inputs (all "1", simultaneously) which produces a "0" output in typical NAND gate fashion. Gates Z1 through Z4 function in this manner and their output terms follow the truth table listing. Single input gates Z5 through Z9 offer circuit buffering and invert the input signal applied. For example, a logical "1" at the Z5 input is inverted by the gating action and appears as a "0" at the Z5 output terminal. Note that for positive logic operation a logical "0" is a low or ground condition and a logical "1" is a high or open circuit condition.

Detail B lists the logic states at the inputs of gates Z1 through Z4 for tuning dial settings of 02.0 to 02.9, at the 10 mc and 1 mc dials only. These dials determine the first digit of the LPA 5-wire code at the W1 position. The resultant 011 condition at the inputs of gate Z4 produces a logical "1" output, saturating switching stage Q1 and energizing relay K1. The LPA binary code is negative logic to the extent that the open circuit at relay K1 contacts is considered as a logical "0". Consequently, when relay K1 is energized the band encoder output for the W1 line is a "0".

Detail C lists the logic states of gates Z1 through Z4 for tuning dial settings of 04.0 to 04.9, at the 10 mc and 1 mc dials only, to illustrate gate operation when the W1 output line is a logical "1" and relay K1 is not energized. Now, the 111 condition at the gate Z4 inputs produces a logical "0" at the gate output. Switch stage Q1 is cut-off and relay K1 de-energized. The W1 line is in a ground state ("1" state for the LPA code).

(b) ENCODER OPERATION. (See figures 4-29 and 4-30.) - The description of NAND gate operation given in the previous paragraph also applies in general to the operation of the W2 through W5 gate circuits and energizing of relays K2 through K5, all in response to the setting of the 10 mc, 1 mc, and 100 kc tuning dials. For a selected frequency segment (channel) listed in table 4-7, there is a corresponding tuning dial binary code, the energizing of selected 5-wire relays, and a resultant 5-wire binary LPA code.

(2) -12/+15 VOLT REGULATOR A15A1. (See figure 5-81.) - The voltage regulator section contains two similar regulating circuits. The following description of the -12 volt regulator also applies to the +15 volt regulator except for the assigned reference designations. A -18 volt potential from power supply PS1 is applied to a conventional regulating circuit at terminals 1 and 2. Q1 functions as a series regulator controlled by dc amplifier Q2. Zener diode CR1 is the voltage reference in the emitter circuit of Q2. The +18 volt potential for operation of the +15 volt regulator is also supplied by power supply PS1.

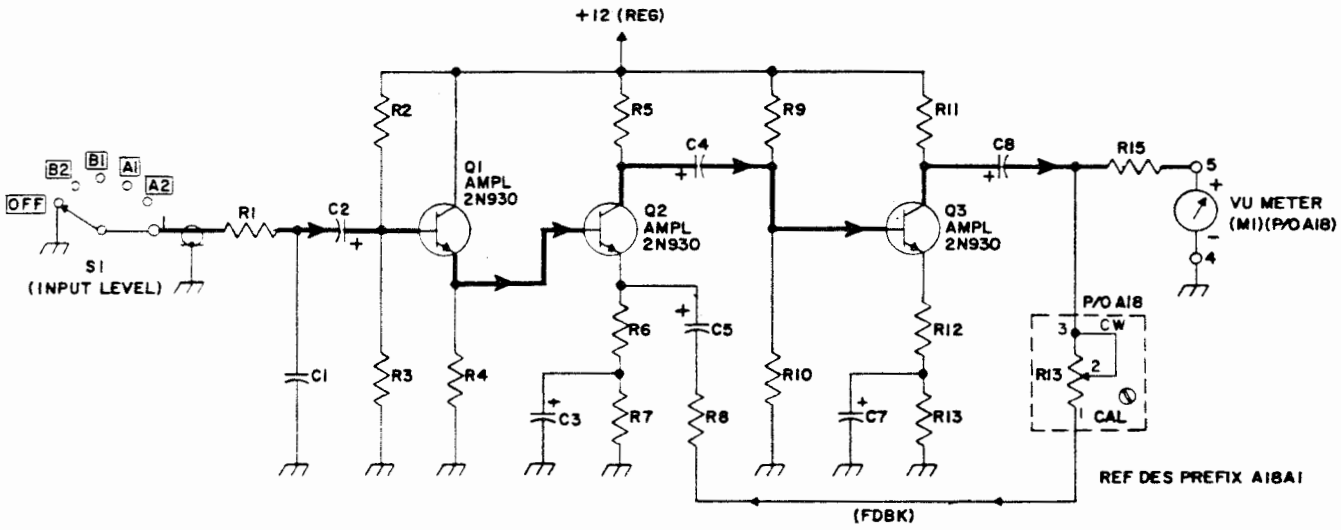


Figure 4-32. VU Meter Amplifier, Simplified Schematic Diagram

4-30. FAULT BOARD A18A2. (See figures 4-33 and 4-34.)

The fault board contains a number of sensitive detecting circuits arranged to monitor selected dc supply voltages, rf signal levels, and external "fault" circuits in the other system units. In the event of a "fault" occurring at one or more of the detecting circuits the over-all transmitting system will be placed in a "standby" condition and the related "fault" indicator illuminated to inform the operator of a "fault" condition. In the case of a STD FAIL fault, where an external standard is available, the transmitting system is not affected. A STD FAIL fault line is supplied for an external fault indicator (STD FAIL).

a. DESCRIPTION. - Table 4-10 lists the fault detection circuits, describes the fault, and identifies the detector components used. The fault board contains fault detection circuits which respond to four categories of circuit faults:

(1) TRANSMITTER FAULT.

(a) KEYER FAULT. - A keyer fault appears as a ground at terminal 36. This provides a dc path, via CR10 and the FAULT OVRD switch, to fault relay K13 on transmitter control module no. 1 (A10). It also provides a dc path to the XMTR FAIL lamp via CR13.

(b) LPA FAULT. - An LPA fault appears as an open circuit at terminal 33. This turns on Q12 which provides a dc path, via CR19, to fault relay A10K13. A dc path to the XMTR FAIL lamp (via CR15) and a dc path (via CR16 and terminal 31) to the tune activate circuits in transmitter control module no. 1 (A10) prevents fault override when the fault is in the LPA.

(c) TRANSMITTER FAIL. - The transmitter fail signal is actuated by the LCU when the exciter is in remote operation and either of the following remote system faults occur:

1. No "class of emission" command.

2. No "sideband" command when "class of emission" command is other than A0 or A2, A3E. The transmitter fail signal appears as a ground closure at terminal 34 of the fault board. The ground closure is applied to the fault circuit as shown in figure 4-33, and acts as described in paragraph (b) above.

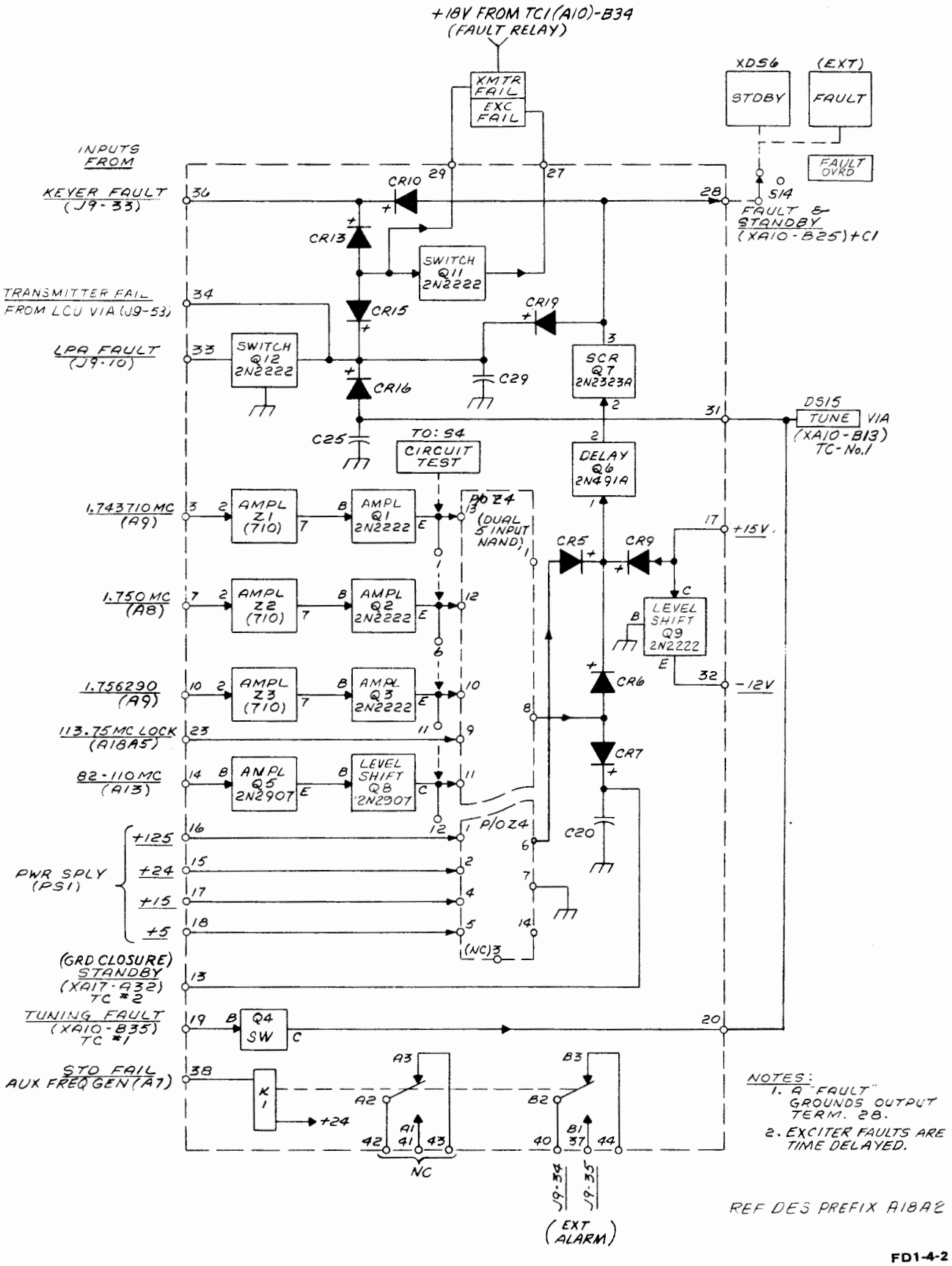


Figure 4-33. Fault Board, Functional Block Diagram

TABLE 4-11. POWER DISTRIBUTION BOARD CIRCUITS

RELAY	"A" CONTACTS CONTROL	"B" CONTACTS CONTROL	METER CAL.	FOR DC SUPPLY
K1	Standby/amplifier off the commands to the LPA.	Electrical latch and AMPL OFF lamp.	None	None
K2	-28 volts dc to TGC module A14.	+28 volts dc to TGC module A14.	None	None
K3	-12 volts dc to TGC module A14 and output amplifier A16.	+125 volts dc to TGC module A14, down-converter A13, and up-converter A11.	R3 R2	-12V +125V
K4	+18 volts dc to output amplifier A16, down-converter A13, up-converter A11, VFG A5, modulator A4 and SIDEBAND SELECTOR switch.	+24 volts dc to output amplifier A16, and down-converter A13.	R4	+24V
K5	+5 volts dc to synthesizer A12, side-carrier generator A9, 1.75/113.75 mc generator A8, and auxiliary frequency generator A7.	+15 volts dc to synthesizer A12, TGC A14, side-carrier generator A9, and auxiliary frequency generator A7.	R7 R6	+5V +15V

Relay K1 is energized by a "standby" command (ground) at terminal 22 from transmitter control no. 1 module A10, and is latched in via contacts b2 and b1. The removal of ground from contact b3 (terminal 27) extinguishes the AMPL OFF lamp. The closure of contacts a2 and a1 provide a "standby" command to the LPA. Relay K1 is de-energized by an "amplifier off" command from the AMPL OFF front panel control or by a loss of power. When K1 is de-energized the opening of contacts a2 and a1 provide an "amplifier off" command to the LPA, and the closure of contacts b2 and b3 lights the AMPL OFF lamp on the exciter front panel.

Relays K2 through K5 apply dc operating potentials to the various modules when the OPERATE pushbutton is pressed, grounding terminal 16. Note that for "standby" conditions the dc supply voltages for critical circuits such as 1 mc frequency standard A6 and transmitter control modules A10 and A17 are not removed. This is because the frequency standard operating voltage cannot be interrupted without observing a warm-up and recalibration period, and the transmitter control circuits must be in constant operation for command functions.

The five meter calibration adjustments R2, R3, R4, R6, and R7, are used to calibrate the CIRCUIT TEST panel meter M2 for the +125, -12, +24, +15, and +5 volt dc positions of the meter switch, respectively. In this manner, the meter will indicate in the colored scale segment for each correct supply voltage monitored. Because these dc supply voltages are from regulated power supplies, calibration adjustments are required as the supply voltage accuracy exceeds that of the meter; especially the meter scale linearity at a midscale point.

Resistor R5 reduces the 28 volt relay operating voltage to limit the relay coil heat dissipation for long energized periods. Jumpers at terminals E1 through E12 permit

disconnection of any power supply voltage in the event of a short circuit in the load. (This is for use by repair technicians only.)

b. PRELIMINARY CHECK. (See figure 5-89.) - Make a preliminary check of the power distribution board to verify that all terminal connections are secure.

c. TEST EQUIPMENT. - Use Electronic Multimeter AN/USM-116. No special tools are required.

d. CONTROL SETTINGS. - Preset controls as indicated in table 3-1. (Place exciter in "standby" condition.)

e. TEST DATA. (See figure 5-89.) - Trouble shooting the power distribution board consists of checking relay operation by measuring the dc supply voltage at a load terminal and then placing the exciter in "standby" condition to remove the voltage by opening the voltage supply relays.

(1) Connect multimeter to terminal 19. Meter should read 0 volts. Press OPERATE button. Meter should read -28 volts dc. Press STANDBY button.

(2) Repeat step (1) at terminals 8, 3, 10, 20, 14, 32, and 26 for dc supply voltages of +28, -12, +125, +18, +24, +5, and +15 volts, respectively.

4-35. POWER SUPPLY PS1. (See figures 4-37, 4-38, 4-52, and 5-63.)

The power supply module contains an ac power supply and rectifier circuits providing outputs of -28 volts and +40 volts dc, and a 70 volt (rms) output. This supply is followed by voltage regulating circuits which supply -18, +18 and +5, +24 and +15, +125, and +28 volts dc. The complete power supply operates from a primary power source of 115/230 volts ac, 50-60 cycles, single phase. Primary operating voltage is selected by switch PS1S1. In the event of abnormal current drain from any of the regulating circuits, circuit breaker A18CB1 on the exciter front panel will "trip" to remove primary power from the supply.

a. DESCRIPTION. - Table 4-12 lists the power supply regulating circuits and gives the input and output voltages for each circuit.

(1) POWER SUPPLY TRANSFORMER/RECTIFIER. - The power supply transformer/rectifier section consists of transformer T1 with primary voltage switch S1, full-wave rectifier CR1 and CR2, and bridge rectifier CR3 through CR6. Switch S1 connects the two primary transformer windings in parallel for 115 volt operation or in series for 230 volt operation.

Bridge rectifier CR3-CR6 supplies -28 vdc to -18V regulator PS1A1 and also as a power supply output voltage. Input capacitor C1 functions as a filter capacitor, and Zener diode CR8 and resistor R2 provide a fixed voltage drop prior to series regulator stage Q7. Full-wave rectifier CR1 and CR2 delivers +40 volts dc to the input of +28 volt regulator PS1A3. The 70 volts (rms) from transformer winding terminals 10 and 11 goes to the input of +125 volt regulator PS1A2A3.

(2) -18 VOLT REGULATOR PS1A1. - The -18 volt dc regulator consists of series regulator stage PS1Q7, complementary pair Q2 and Q3, and emitter follower Q1; diodes CR2, CR3, and CR4, and Zener diode CR5. Circuit operation is conventional, but it should be noted that this is a "negative" voltage regulator and consequently some functions are inverted. A sample of regulated output voltage from the junction of resistors R6 and R7 is applied to the base of Q3 and compared with a reference voltage from Zener diode CR5 at the emitter of Q3. Any voltage difference is amplified by Q2 and applied to the base of regulator Q7 as a dc control voltage, via amplifier stage Q1. Diodes CR2, CR3, and CR4 protect the regulation circuit if the output becomes shorted. In this event, the large IR drop across resistor R4 causes diode conduction and cuts off the base of Q1 (via PS1Q7) reducing the regulator output voltage to zero.

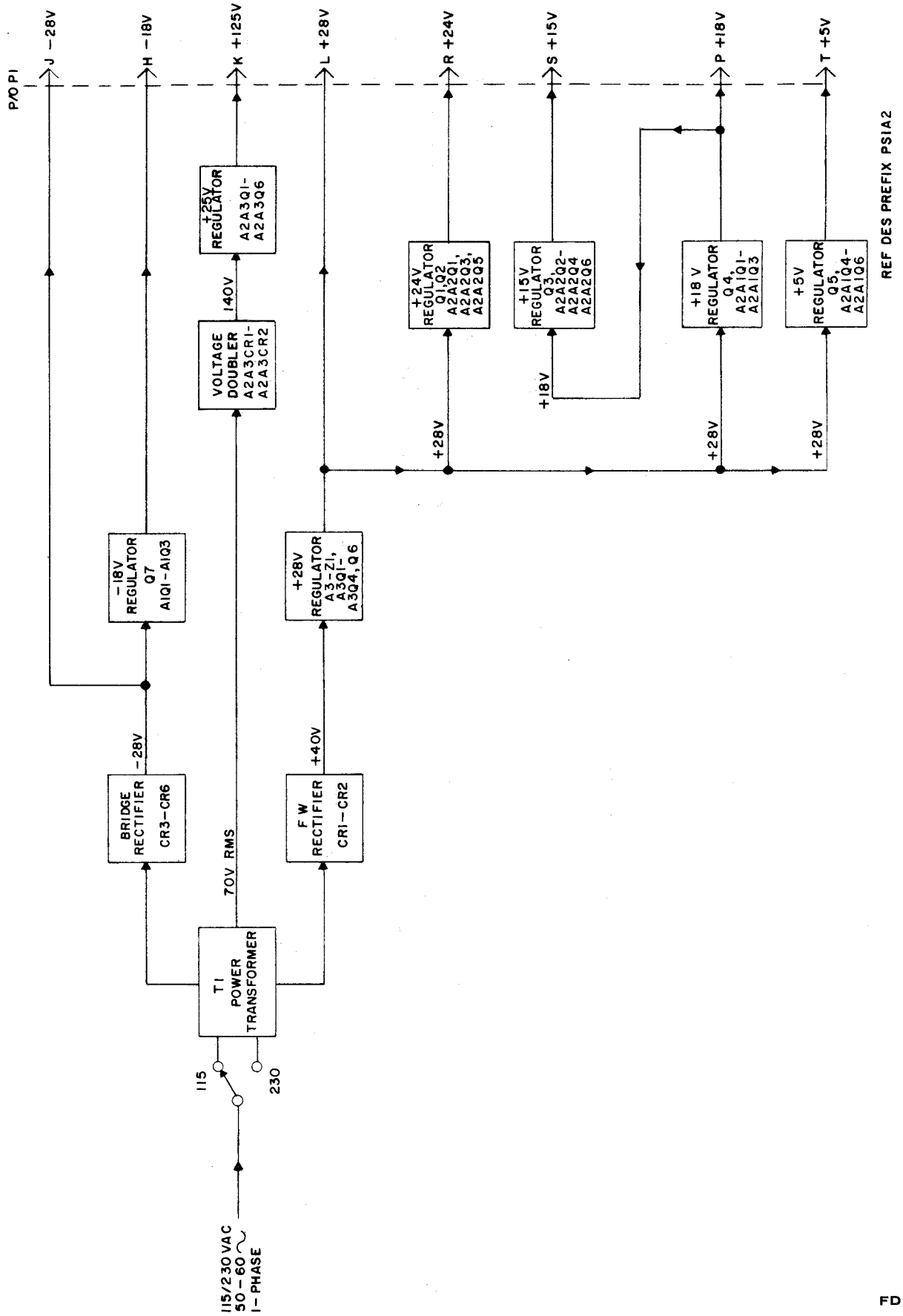
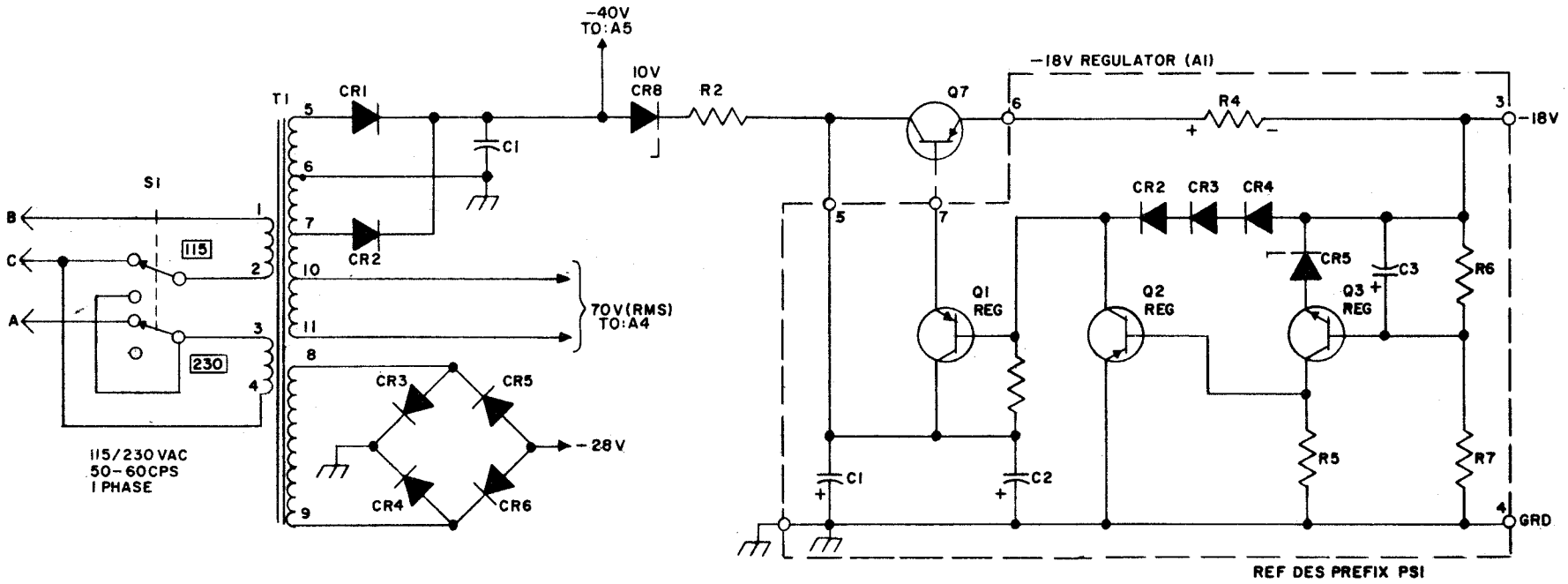


Figure 4-37. Power Supply, Functional Block Diagram



FD1-4-3

Figure 4-38. Power Transformer and -18 Volt Regulator, Simplified Schematic Diagram

TABLE 4-12. POWER SUPPLY REGULATORS

REF DES.Δ	CIRCUIT NAME	INPUT VOLTAGE	OUTPUT VOLTAGE	LOAD "I"
PS1 (p/o)	Power supply (transformer and rectifiers)	115/230 vac	-28 vdc +40 vdc 70V rms	6A.* 3A.
A1	-18 volt regulator	-28V	-18V	0.6A.
A2A1	+18 volt and +5 volt regulator	+28V	+18V +5V	1.5A. 1.2A.
A2A2	+24 volt and +15 volt regulator	+28V	+24V +15V	2A. .6A.
A2A3	+125 volt regulator	70V (rms)	+125V	.01A.
A3	+28 volt regulator	+40V	+28V	3A.

Δ Prefix by PS1
* Intermittent duty

(3) +18 AND +5 VOLT REGULATORS A2A1. - The +18 and +5 volt regulators are contained on a common circuit board. The +18 volt circuit consists of series regulator stage PS1Q4; dc amplifiers Q1, Q2, and Q3; and IC differential comparator Z1. The +5 volt circuit is similar and consists of series regulator stage PS1Q5; dc amplifiers Q4, Q5, and Q6; and IC differential comparator Z2. Both regulating circuits are of the switching type employing a series inductor (L1 and L2) and a commutating diode (CR4 and CR6). Regulator switching is triggered by the externally supplied 12.5 kc "sync" pulse. Although the following description is of the +18 volt regulator circuit it also applied to the +5 volt regulator circuit.

A +28 volt dc supply voltage from the output of +28 volt regulator A3 is applied to the emitter of switching regulator PS1Q4 and also as the operating voltage for switch driver stages Q1 and Q2. Q2 is switched on and off by current amplifier Q1, in response to drive pulses from differential comparator Z1. The comparator output is approximately 6 volts above ground. To assure a "turn-off" by switch Q2, Zener diode CR3 inserts a "bucking" potential in series with the emitter of Q1, restoring the pulse to a ground reference level. Differential comparator Z1 compares a sample of the +18 volt regulator output, via amplifier Q3, with a fixed reference voltage from Zener diode CR2. When the regulated output level exceeds the reference voltage, the pulse width from Z1 is decreased to lower the switch stage (PS1Q4) "on" time and, thereby lower the regulator output voltage. When regulator output is less than the reference voltage, the switch stage "on" time is increased by an increase in the switching pulse width from Z1, thereby raising the regulator output voltage. In this manner the switch regulator is controlled in a step sequence to regulate the output voltage and hold it constant.

To stabilize the switching regulator and improve operation, a 12.5 kc "sync" pulse is applied to the base of Q3 via capacitor C7, and is then applied to differential comparator Z1 through a low pass filter consisting of resistors R12 and R13, and capacitors C4 and C5. The "sync" pulse times the comparator operation and governs the switching rate of PS1Q4.

Regulation is also a function of inductor L1 and commutating diode CR4. Dc pulses at the output of switch stage PS1Q4 are applied through a low pass filter consisting of inductor L1 and capacitors C3, C8, and C9. During PS1Q4 "off" intervals, the collapsing field at inductor L1 charges capacitors C8 and C9, with commutating diode CR4 providing a return

path. (Back-emf of L1 has a reversed polarity causing CR4 to conduct.) In this manner a charge at capacitor C8 (and C9) is maintained during "off" switch periods to assure output current to the load.

It is apparent that Zener reference diode CR2 supplies a reference voltage to both the +18 and +5 volt regulating circuits at Z1 and Z2, and that Zener diode CR1 supplies a regulated operating voltage to both comparators at terminal 8. With the exception of the reference designations employed, the operation of the +18 and +5 regulators is identical.

(4) +24 AND +15 VOLT REGULATORS (A2A2). - The +24 and +15 volt regulators are contained on a common circuit board. The +24 volt regulator consists of a Darlington series regulator formed by PS1Q1 and PS1Q2, differential amplifier Q3 and Q5, and dc amplifier Q1. The +15 volt regulator is similar, and uses series regulator stage PS1Q3, differential amplifier Q4 and Q6, and dc amplifier Q2. Both circuits employ conventional voltage regulating techniques. Although the following circuit description applies specifically to the +24 volt regulator it also describes the +15 volt regulator circuit except for a different set of reference designations.

Series regulator stage Q1 and Q2 receives a +28 volt dc potential from +28 volt regulator PS1A3. This stage is conducting at all times, the amount of conduction being controlled by dc amplifier Q1. A sample of the +24 volt output voltage is obtained from the junction of resistors R15 and R16, and compared with a fixed dc reference voltage from Zener diode CR7 at difference amplifier Q3 and Q5. The voltage difference is amplified by Q1 and applied to the base of series regulator PS1Q1. When the sampled voltage exceeds the reference voltage, the differential amplifier drives Q1 to increase the voltage drop across the series regulator. When the sampled voltage is less than the reference voltage, the series regulator voltage drop is decreased. In this manner, the series regulator conduction is controlled to correct the regulator output voltage and maintain a constant level. Zener diode CR1 biases amplifier Q1 to raise the dc signal level at its base to a corresponding level with the collector of Q3 (dc restoration).

Capacitors C7 and C9 at board terminals 1 and 8 are externally connected to A2A1-3, and provide output filtering for the +5 volt regulated supply voltage.

(5) +125 VOLT REGULATOR A2A3. - The +125 volt regulator circuit consists of a voltage-doubler rectifier CR1 and CR2; three cascaded series regulator stages Q1, Q2, and Q6; and a dc control amplifier consisting of difference amplifier Q4 and Q5, and dc amplifier Q3.

Voltage-doubler rectifiers CR1 and CR2 receive a 70 volt rms potential from power transformer PS1T1. The rectified (and doubled) potential is filtered by an RC low-pass filter consisting of resistor R1 and capacitors C3 and C4. Resistors R2 and R3 assure an even distribution of dc voltage across capacitors C3 and C4. Filter output is applied to cascaded series regulators Q1, Q2, and Q6. A sample of the +125 volt output potential is obtained from the junction of resistors R16 and R17, and compared with a fixed dc reference voltage from Zener diode CR10 at difference amplifier Q4 and Q5. Any voltage difference is amplified by Q3 and applied to the base of series regulators Q1 and Q2 via dc level stabilizing Zener diode CR6. When the sampled voltage exceeds the reference voltage, the difference amplifier drives Q3 to increase the voltage drop across regulators Q1 and Q2. When the sampled voltage is less than the reference voltage, the series regulator drops are decreased. In this manner, series regulator conduction is controlled to correct and maintain the +125 volt dc output level. Zener diode CR7 biases amplifier Q3 to raise the dc signal level at its base to a level corresponding with the collector of Q4. Operating potentials for stages Q3, Q4, and Q5 are obtained from the +24 volt output of regulator A2A2. Zener CR3 regulates this potential with resistor R4.

Diodes CR4 and CR5 in shunt to the emitter-base circuit of Q1 protect this stage in the event of abnormal supply current drain. The IR drop across resistor R8 increases causing diodes CR4 and CR5 to conduct, limiting the conduction of series regulator Q1. Diodes CR8 and CR9 function in a similar manner for series regulator Q2.

Series stage Q6 functions as an active ripple filter. The base of Q6 is driven from the +125 volt regulator output via resistor divider R18 and R19. Any ripple frequency across capacitor C9 is applied between the emitter and base via capacitor C8, and removed by the Q6 self-regulating action. Capacitors C5 and C6 serve to bypass ripple components from the base of series regulators Q1 and Q2.

(6) +28 VOLT REGULATOR PS1A3. - The +28 volt regulator circuit consists of series switching regulator PS1Q6; dc amplifiers Q2, Q3, and Q4; IC differential comparator Z1; and overload protection stage Q1. This is a switching-type regulator and is similar in operation to the +5 and +18 volt regulators (A2A1) previously described.

A +40 volt dc potential from full-wave rectifier PS1CR1 and PS1CR2 is applied to series regulator PS1Q6 (via overload sensing resistor PS1R1) and also as the operating voltage for switch driver stages Q2 and Q3. Q2 is switched on and off by current amplifier Q3 in response to drive pulses from differential comparator Z1. Z1 compares a sample of the +28 volt regulator output voltage, via amplifier Q4 and isolation diode CR6, with a fixed reference voltage from Zener diode CR2. When the regulated output level exceeds the reference voltage, the pulse width from Z1 is decreased to reduce the switch stage Q2 "on" time and thereby lower the regulator output voltage. When regulator output is less than the reference voltage, the switch stage "on" time is increased by an increase in the switching pulse width from Z1, thereby raising the regulator output voltage. In this manner the switch regulator is controlled in step sequence to regulate the output voltage and hold it constant.

To stabilize the switching regulator and improve operation, a 12.5 kc "sync" pulse is applied to the base of Q4 via capacitor C9, and is then applied to differential comparator Z1 through a low pass filter consisting of resistors R11, R12, and R13; and capacitors C6 and C8. The "sync" pulse times the comparator operation and governs the switching rate of PS1Q6.

Regulation is also a function of inductor L1 and commutating diode CR7. Dc pulses at the output of switch stage PS1Q6 are applied through a low pass filter consisting of inductor L1 and capacitors C5 and C7. During the switch stage "off" intervals, the collapsing field at inductor L1 charges capacitors C5 and C7, with commutating diode CR7 providing a return path. (Back-emf of L1 has a reversed polarity causing CR7 to conduct.) In this manner a charge at capacitor C5 (and C7) is maintained during "off" switch periods to assure output current to the load.

Stage Q1 is biased by the IR drop across resistor PS1R1. In the event of an abnormally high current drain from the regulator, the IR drop across R1 drives Q1 to saturation, driving differential comparator Z1 to reduce the regulator output via isolation diode CR4. Zener diode CR5 establishes a fixed level of comparator input (error) voltage for the output of both amplifier Q4 and stage Q1. Zener diode CR3 regulates the operating potential applied to differential comparator Z1 at terminal 8 (the Vcc terminal). Capacitor C2 introduces a time lag in the overload (Q1, R1) circuit.

WARNING

Deadly voltages are present at the power supply terminals.
Use extreme caution when trouble shooting.

b. PRELIMINARY CHECK. (See figure 5-63.) - Make a preliminary check of the power supply before trouble shooting, with emphasis on the following:

(1) Seating of connector PS1P1 in its socket.

(2) Seating of connectors PS1J1 and PS1P2.

(3) Soldered connections to socket XPS1.

c. TEST EQUIPMENT. - Use Electronic Multimeter AN/USM-116 and Frequency Counter H-P 5245L. No special tools required.

d. CONTROL SETTINGS. - Preset all controls as indicated in table 3-1.

e. TEST DATA. (See figure 5-63.) - Checking the power supply consists of checking the input sync signal and measuring the power supply output voltages at the appropriate terminals.

(1) Connect frequency counter to XA12P2 pin CC. Counter should read 12.500 kc ±1 count.

(2) Connect multimeter to A18A4 terminal 18. Meter should read -18 vdc ±5%.

(3) Connect multimeter to A18A6 terminal 15. Meter should read +125 vdc ±5%.

(4) Connect multimeter to A18A6 terminal 5. Meter should read +18 vdc ±5%.

(5) Connect multimeter to A18A6 terminal 11. Meter should read +24 vdc ±5%.

(6) Connect multimeter to A18A6 terminal 18. Meter should read +15 vdc ±5%.

(7) Connect multimeter to A18A6 terminal 6. Meter should read +5 vdc ±10%.

(8) Connect multimeter to A18A6 terminal 7. Meter should read +28 vdc ±10%.

4-36. REAR FILTER-PANEL A19. (See figures 4-39 and 5-91.)

The rear filter-panel contains cable connectors and rf interference filters for external exciter connections to the primary ac power source and to the LPA and LCU system units (the external rf power amplifier and the Decoder-Encoder KY-656/FRT). Table 4-13 lists the retractable cable connection between the exciter chassis and the rear filter-panel attached to the exciter enclosure, identifies the cable connectors, and gives the type and number of conductors employed. The 51-conductor flat ribbon is color coded in groups of ten leads and employs the RMA resistor color code for lead identification. The RG-196 coaxial cables and the twisted shielded pair cables are white in color. In addition, connectors J2 and J3 have IC low-pass filters in series with the rf cable connections. These connectors are in dc control voltage circuits, and the low-pass filters reject any spurious rf signals present.

Retractable cables are arranged within the enclosure so that the exciter drawer can be opened and closed; the flat cables accommodating this motion.

4-37. SERVICING BLOCK DIAGRAMS.

Figures 4-40 through 4-52 are servicing block diagrams for the applicable exciter modules. These illustrations provide maintenance technicians with a pictorial guide for use in trouble shooting. Main signal flow or data paths are represented by heavy lines and light lines are used for secondary paths. Arrow heads, placed on the flow lines, indicate the direction of signal flow. Waveforms, where applicable, are placed at appropriate test points on the service block diagrams.

5-3. TUNING AND ADJUSTMENT PROCEDURES.

The following paragraphs provide alignment and adjustment information for each applicable module and circuit board. Control settings, when they differ from the settings of table 3-1, are given in the applicable paragraph.

CAUTION

Place exciter at "standby" before removing or replacing a plug-in module. Voltage surges when live contacts are broken can damage the circuit components.

a. POWER SUPPLY PS1. (See figures 5-49 through 5-54.)

(1) TEST EQUIPMENT AND SPECIAL TOOLS.

(a) Volt-ohmmeter AN/PSM-6.

(b) Alignment tool, J. F. D. S284.

(c) Test jig (see figure 2-2).

(2) CONTROL SETTINGS. - Preset exciter controls in accordance with table 3-1.

(3) TEST SETUP. - Exciter connected to test jig as instructed in paragraph 2-5b (through step (4)).

(4) CONNECTIONS. - See procedures below.

(5) PROCEDURES. - See figure 5-63, sheet 1.

(a) Turn off exciter and remove power supply cover.

(b) Connect voltmeter (+) lead to PS1A3 terminal 4, and (-) lead to ground.

(c) Energize exciter as instructed in paragraph 2-5b.

(d) Adjust PS1A3R18 for +28 vdc.

(e) Turn off exciter and replace power supply cover.

b. FREQUENCY STANDARD A6. (See figure 5-9.)

(1) TEST EQUIPMENT AND SPECIAL TOOLS.

(a) Standard-frequency oscillator, General Radio type 1115-C.

(b) Test jig (see figure 2-2).

(2) CONTROL SETTINGS. - Preset exciter controls in accordance with table 3-1.

(3) TEST SETUP. - Exciter connected to test jig as instructed in paragraph 2-5b (through step (4)).

(4) CONNECTIONS. - See procedures below.

(5) PROCEDURES. - To check calibration of the internal 1 mc frequency standard, a secondary 1 mc standard having a stability of one part in 10^9 is used. The CIRCUIT TEST panel meter serves as a "null" indicator during calibration.

(a) Energize exciter as instructed in paragraph 2-5b; energize secondary 1 mc standard as instructed in applicable technical documentation.

Note

For maximum accuracy, allow a 1 hour warm-up period prior to calibration of the internal 1 mc frequency standard.

(b) Connect the external 1 mc frequency standard (standard-frequency oscillator) to the 1 MC STD IN connector (A19J4) on the rear panel. The amplitude should be from 0.3 to 3 vac rms.

(c) Set the CIRCUIT TEST switch to the FREQ STD LOCK position.

(d) Observe the period of oscillation (from left to right to left to right or vice versa) for the pointer of the front-panel CIRCUIT TEST meter. This period should be greater than or equal to 100 seconds. If the period is less than 100 seconds, calibrate the internal frequency standard by adjusting the FREQ STD control on the auxiliary panel.

Note

If the range of the FREQ STD control is exceeded, adjust the mechanical FREQ ADJ control on the internal frequency standard to return the FREQ STD control within range, and readjust the FREQ STD control as necessary.

c. 1.75/113.75 MC GENERATOR A8. (See figures 5-14 through 5-16.)

(1) TEST EQUIPMENT AND SPECIAL TOOLS.

(a) RF Voltmeter, Boonton Model 91CA.

(b) Oscilloscope, Tektronix 585A.

(c) Insulated alignment tool.

(d) Test jig (see figure 2-2).

(e) 1.75/113.75 mc generator module extender cable.

(2) CONTROL SETTINGS. - Preset exciter controls in accordance with table 3-1.

(3) TEST SETUP. - Exciter connected to test jig as instructed in paragraph 2-5b (through step (4)).

(4) CONNECTIONS. - See procedures below.

(5) PROCEDURES. - See figure 5-67.

(a) Turn off exciter and remove 1.75/113.75 mc generator module A8.

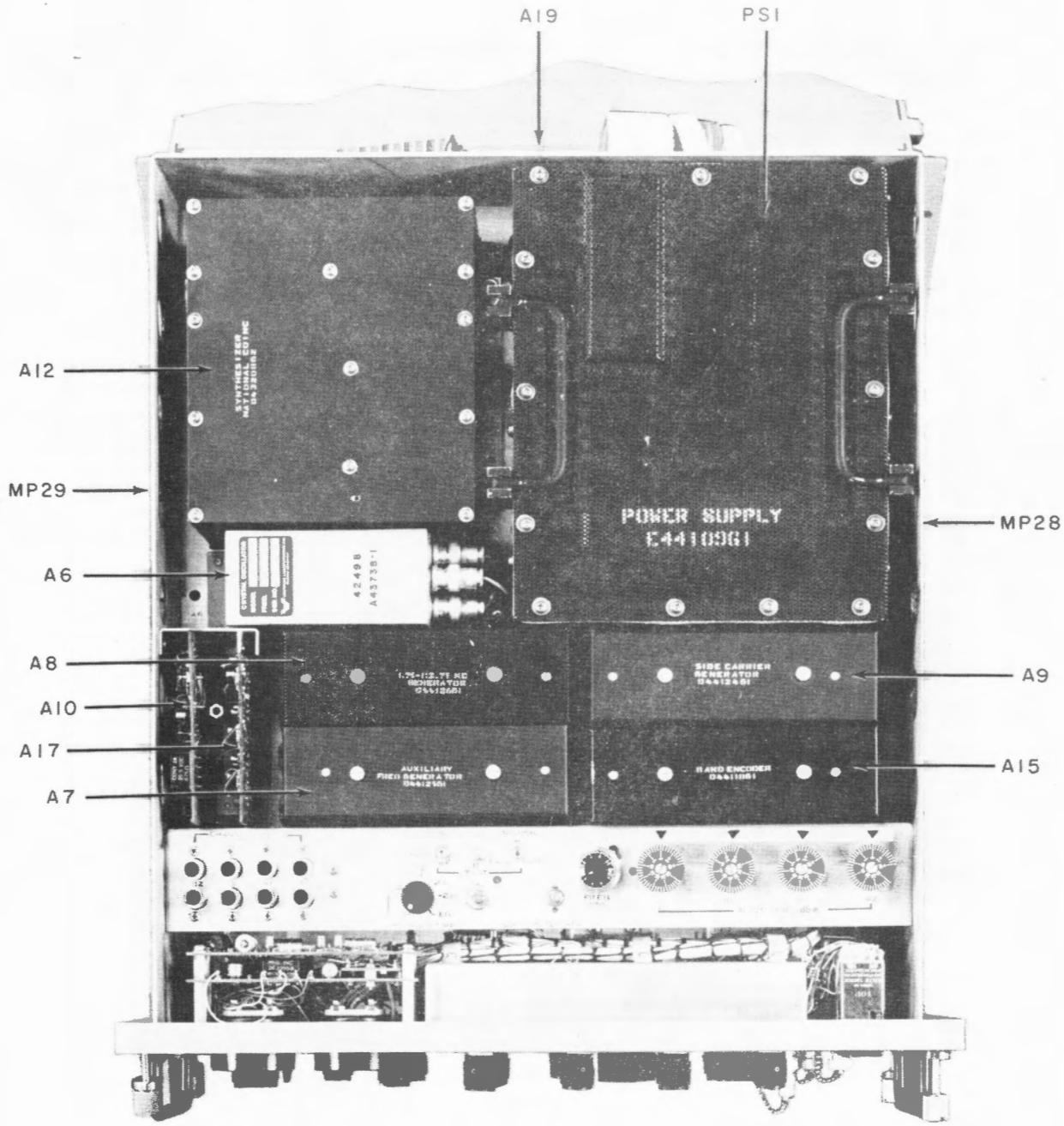
(b) Connect the 1.75/113.75 mc generator to its chassis socket using the module extender cable. Remove module cover.

(c) Energize exciter as instructed in paragraph 2-5b. Place exciter in USB/A0 mode.

(d) Connect oscilloscope leads to A8A2 terminals 1 and 2. Observe a 1 mc square wave signal of approximately 4 volts ±0.5 volt.

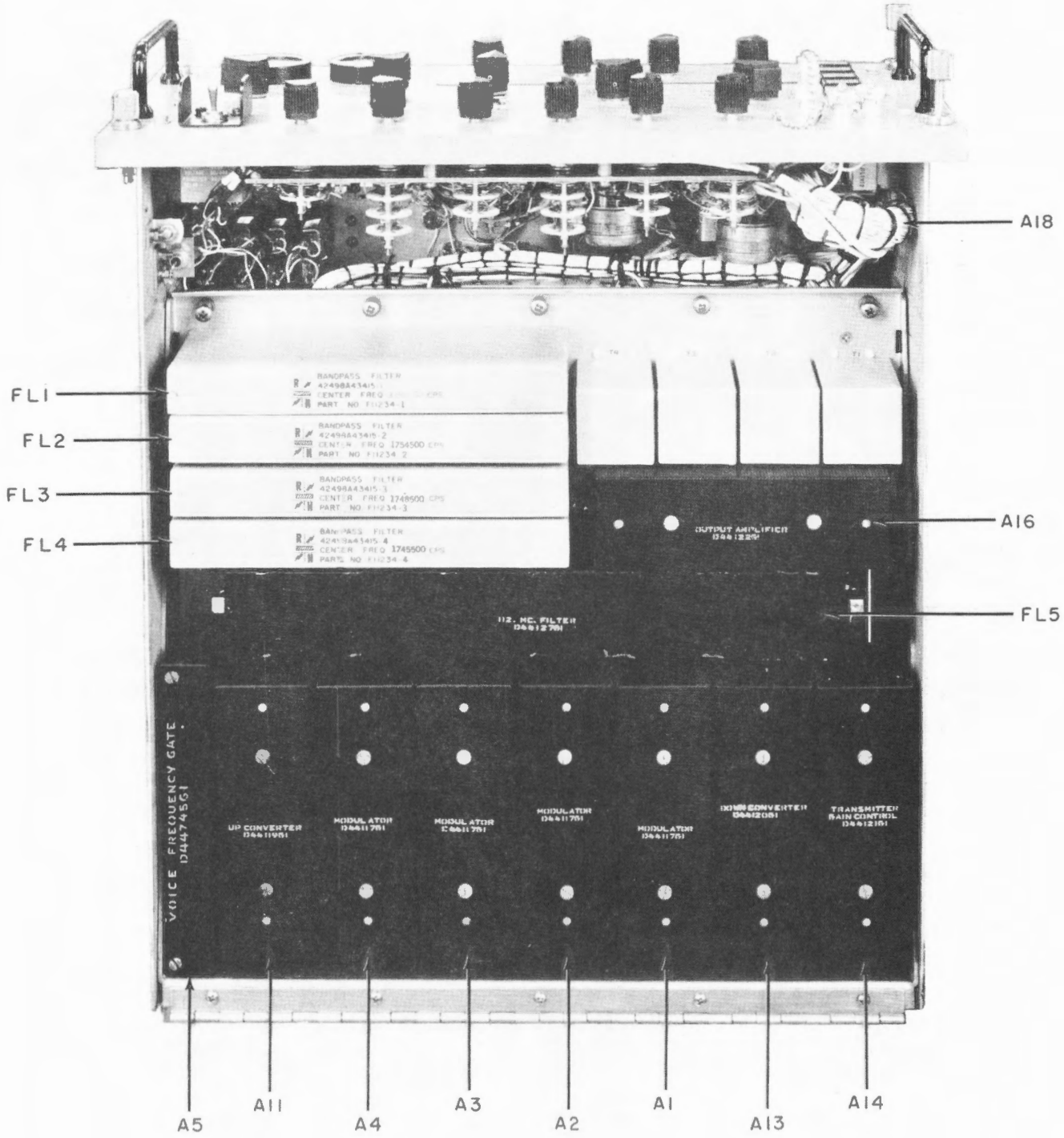
(e) Connect oscilloscope to A8A2 terminals 5 and 6. Observe a 1 mc signal of approximately 1 volt.

(f) Connect the oscilloscope to the collector of A8A2Q6. Adjust A8A2L2 and A8A2L1 for maximum amplitude.



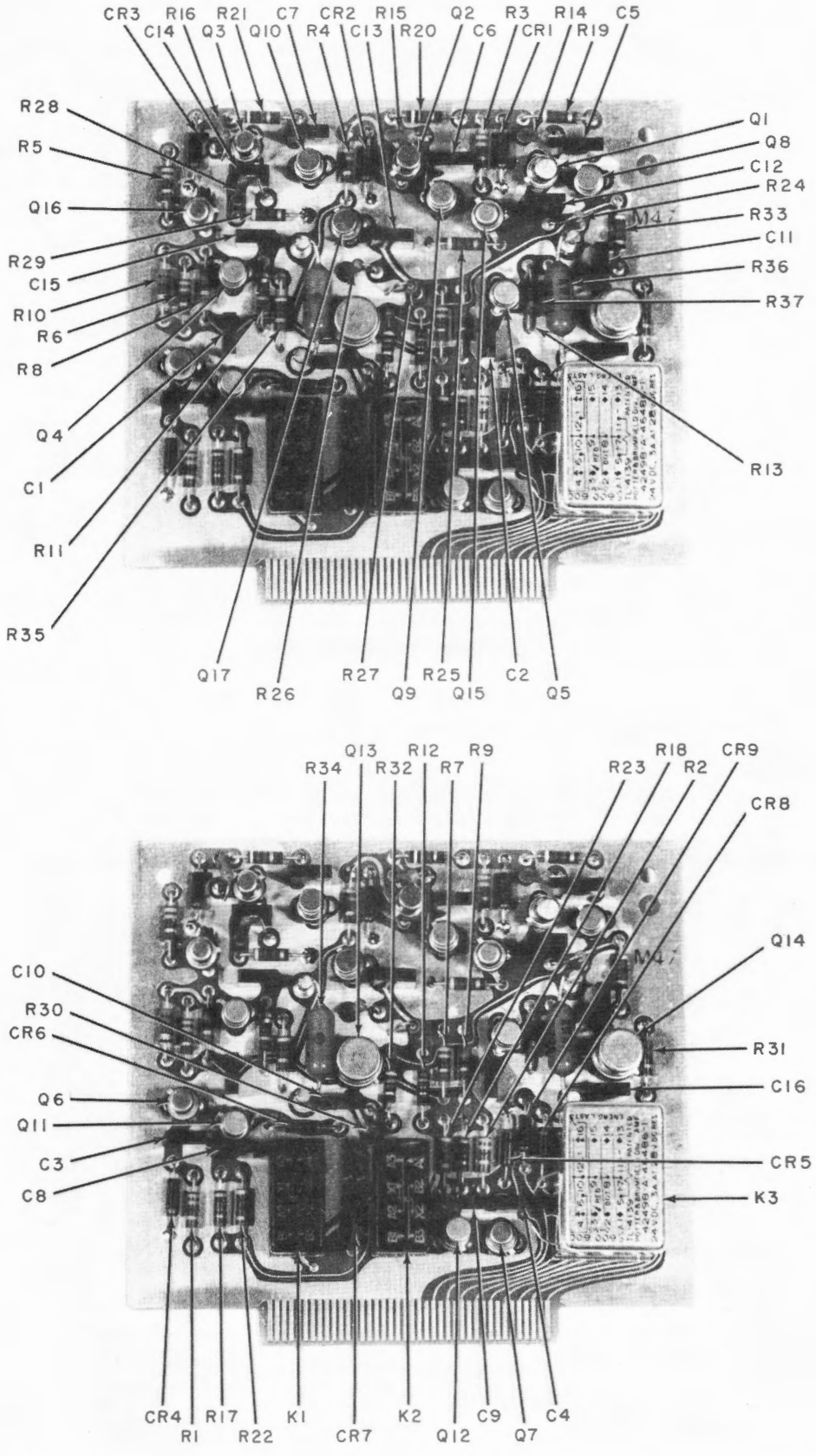
FD1-5-38

Figure 5-1. Modulator-Synthesizer MD-777/FRT, Top View Case Removed



FD1-5-24

Figure 5-2. Modulator-Synthesizer MD-777/FRT, Bottom View Case Removed



FD1-5-22

Figure 5-48. Transmitter Control No. 2, A17, Parts Location

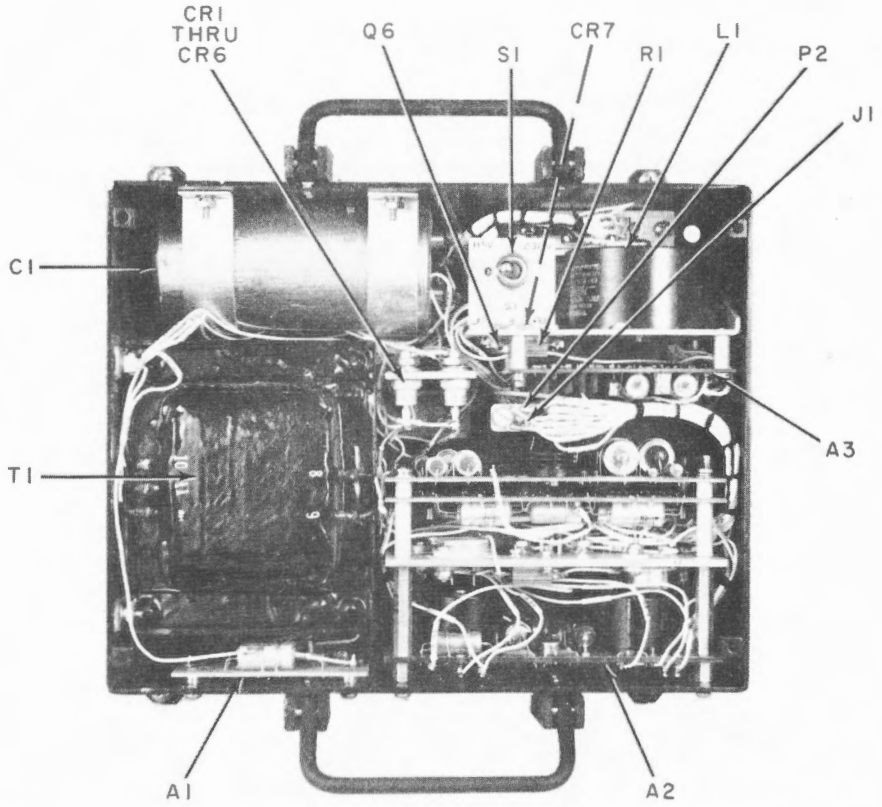
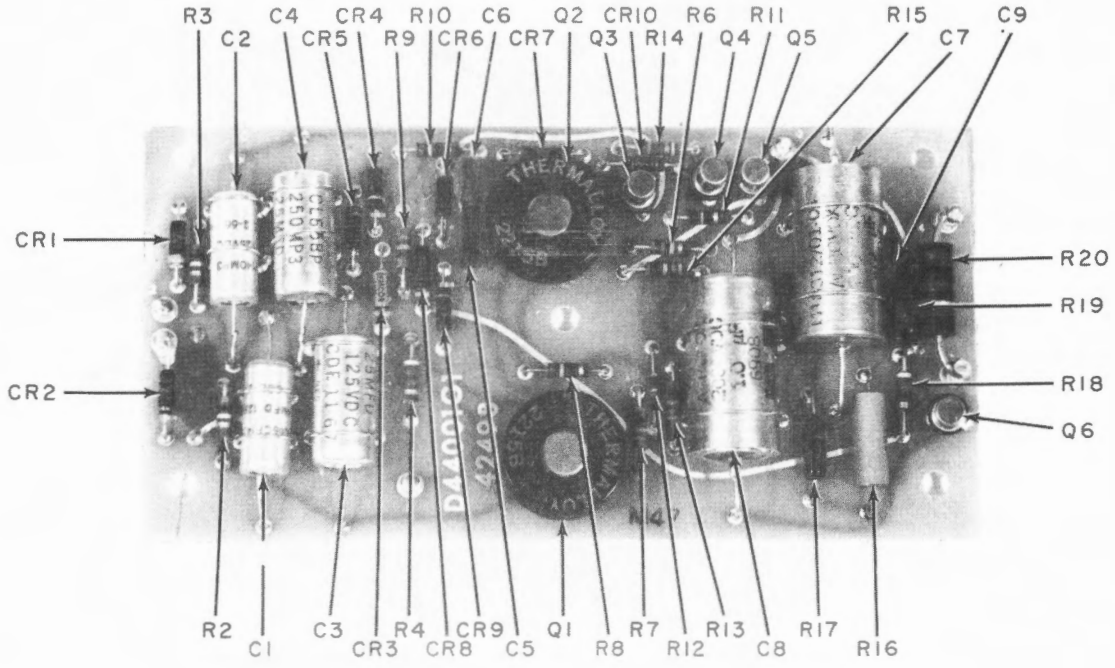
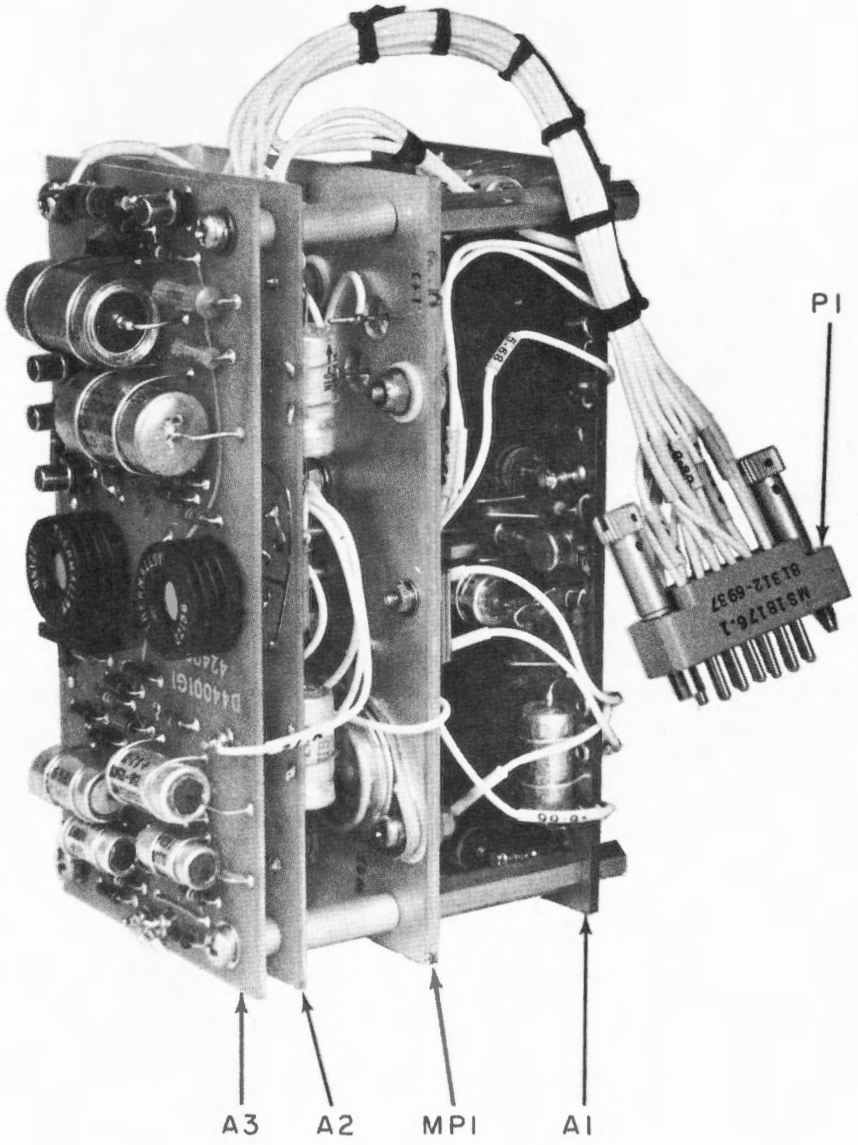


Figure 5-49. Power Supply Module PS1



FD1-5-6

Figure 5-50. +125 Volt Regulator, A2A3, Part of Power Supply PS1, Parts Location



FD1-5-7

Figure 5-50A. Power Supply Regulator Assembly A2,
Part of Power Supply PS1

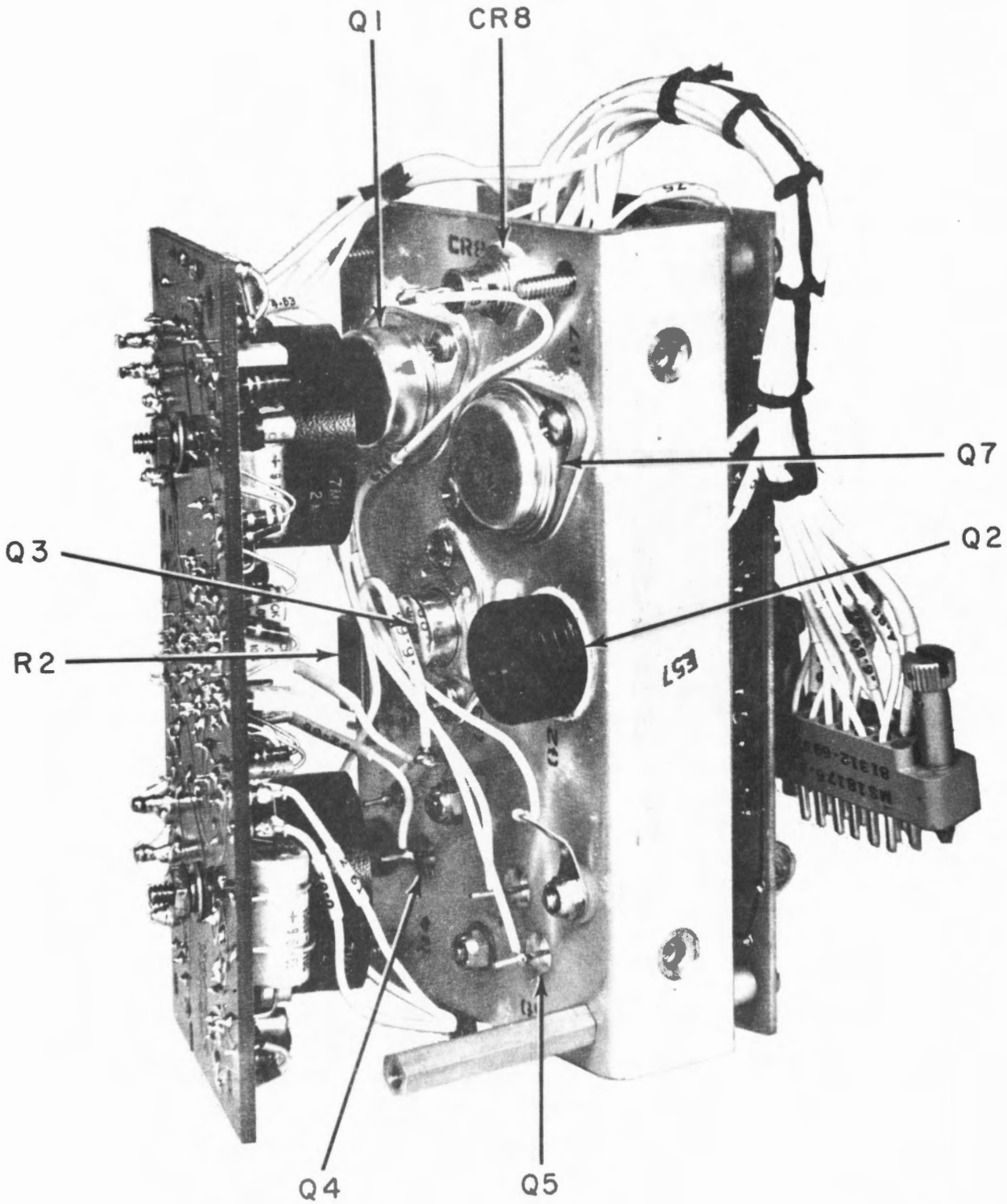


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Figure 5-50B. Bracket Subassembly A2MP1,
Part of Power Supply PS1

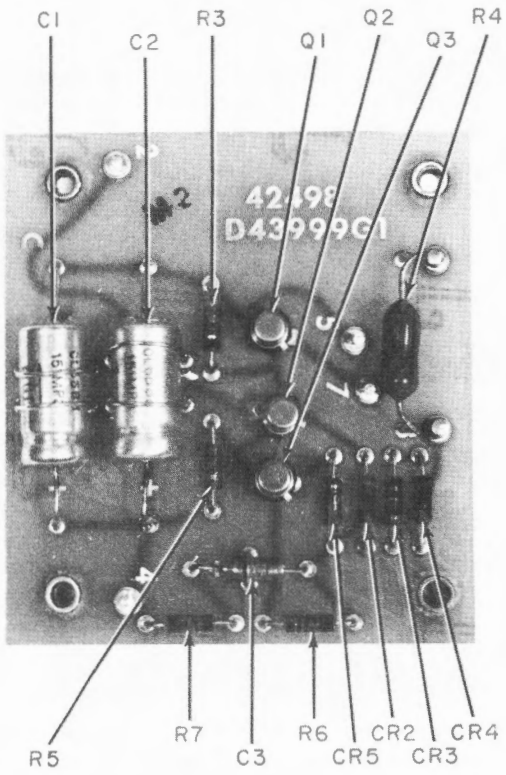


Figure 5-51. -18 Volt Regulator A1, Part of Power Supply PS1, Parts Location

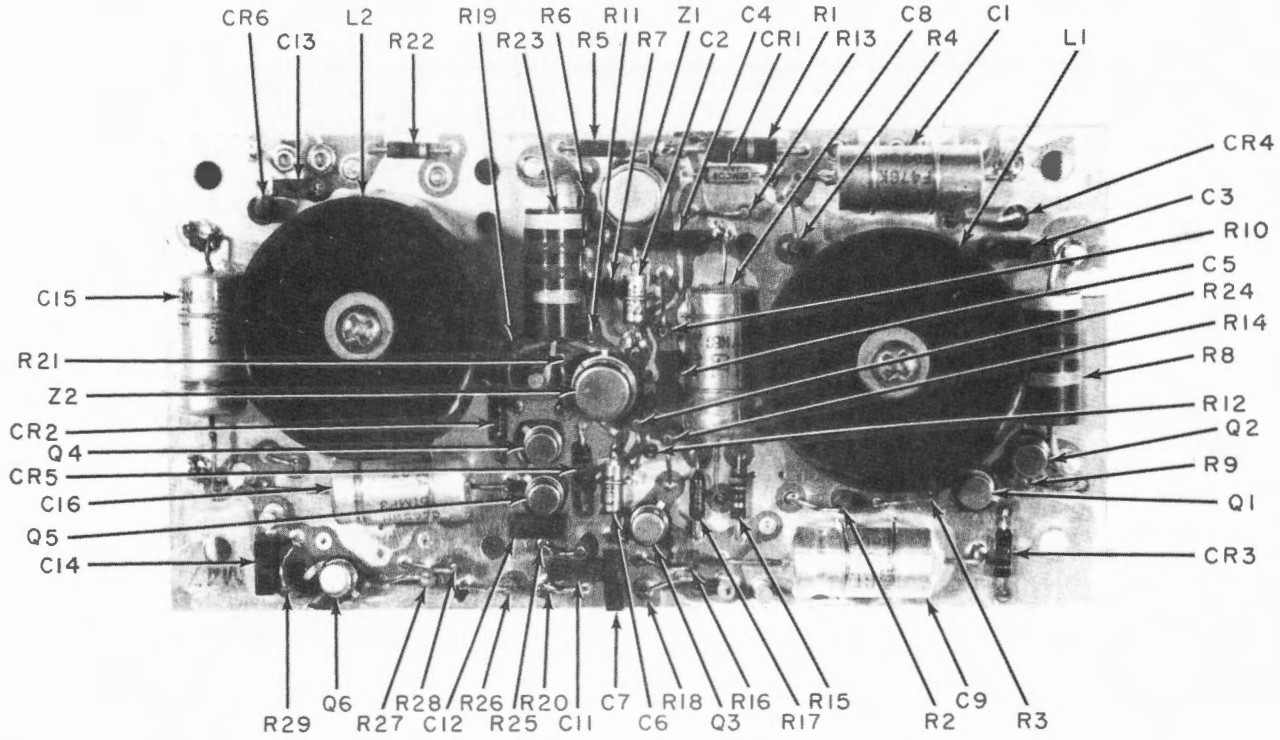


Figure 5-52. +5 and +18 Volt Regulator A2A1, Part of Power Supply PS1, Parts Location

FD1-5-9

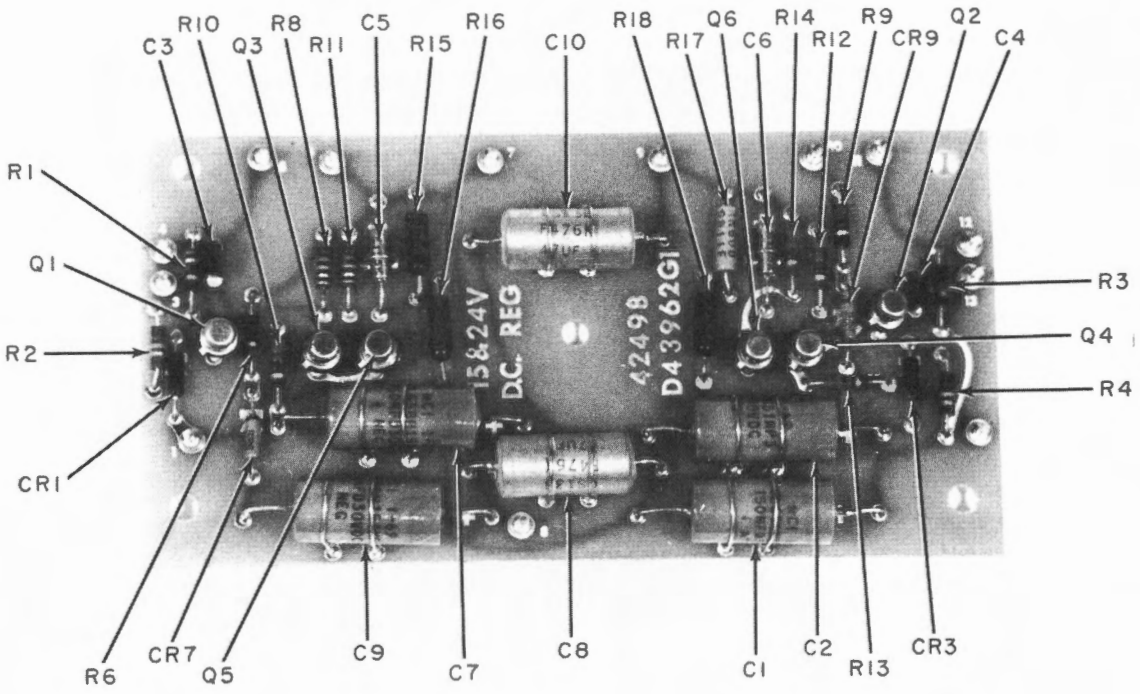
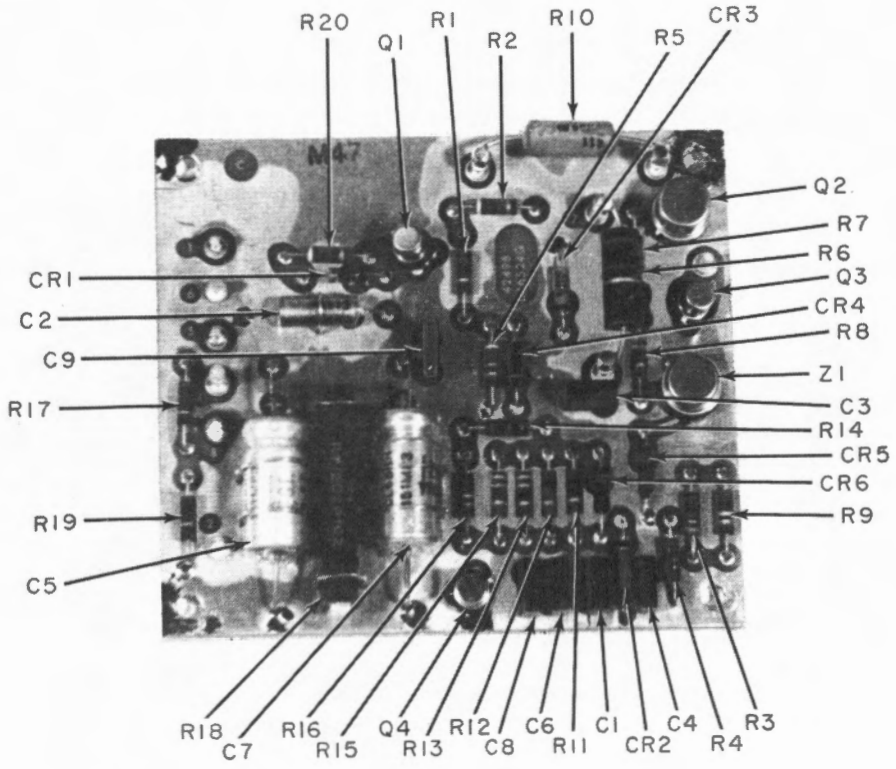


Figure 5-53. +15 and +24 Volt Regulator A2A2, Part of Power Supply PS1, Parts Location



FD1-5-10

Figure 5-54. A3 Switching Regulator, Part of Power Supply PS1

TABLE 6-1. LIST OF UNITS

TABLE 6-1. LIST OF UNITS (Cont)

TABLE 6-2. MAINTENANCE PARTS LIST

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
		MODULATOR-SYNTHESIZER MD-777/FRT: Capable of processing up to 4 independent audio inputs simultaneously; each input is handled by 1 of 4 identical audio frequency modules; provides the terminations for the audio input lines and furnishes Linear Amplifier-Power Supply Group a modulated RF excitation signal adjustable between 0 and 250 milliwatts over the frequency range of 2 to 30 MHz; 42498 dwg E43966G1.	5-1
FL1		FILTER, BANDPASS: 1,751,500 MHz; 50 ohms impedance porm 5 pct in parallel with 0 to 25 pf; 250 MV RMS input level; 42498 dwg A46534-1; 82567 type F12266-1.	5-2
FL2		FILTER, BANDPASS: 1,754,500 MHz; 50 ohms impedance porm 5 pct in parallel with 0 to 25 pf; 250 MV RMS input level; 42498 dwg A46534-2; 82567 type F12266-2.	5-2
FL3		FILTER, BANDPASS: 1,748,500 MHz; 50 ohms impedance porm 5 pct in parallel with 0 to 25 pf; 250 MV RMS input level; 42498 dwg A46534-3; 82567 type F12266-3.	5-2
FL4		FILTER, BANDPASS: 1,745,500 MHz; 50 ohms impedance porm 5 pct in parallel with 0 to 25 pf; 250 MV RMS input level; 42498 dwg A46534-4; 82567 type F12266-4.	5-2
FL5		FILTER ASSEMBLY: 112 MHz; 1.836 in. w by 2.875 in. h by 12.508 in. lg o/a; 42498 dwg A46487-1.	5-2

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A1		MODULATOR ASSEMBLY: Contains two printed circuit boards with all components; audio amplifier board A1 and modulator/agc amplifier board A2; 42498 dwg D44117G1.	5-2
P1		CONNECTOR: MIL type MS18176-1.	5-5

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A1A2		MODULATOR SUBASSEMBLY NO. 2: Printed circuit board with all components assembled for operation; 42498 dwg D43847G1.	5-5
C1		CAPACITOR: MIL type CS13BF105K.	5-7
C2		CAPACITOR: MIL type CK06BX104K.	5-7
C3		CAPACITOR: MIL type CK06CW222K.	5-7
C4		Same as C2.	5-7
C5		CAPACITOR: MIL type CS13BD157K.	5-7
C6		Same as C2.	5-7
C7		Same as C2.	5-7
C8		CAPACITOR: MIL type CS13BE336K.	5-7
C9		CAPACITOR: MIL type CK05CW103K.	5-7
C10		Same as C2.	5-7
C11		Same as C2.	5-7
C12		CAPACITOR: MIL type CS13BF476K.	5-7
C13		CAPACITOR: MIL type CS13BF685K.	5-7
C14		Same as C5.	5-7
C15		Same as C2.	5-7
C16		Same as C2.	5-7
C17		CAPACITOR: MIL type CK05BX102K.	5-7
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-7
CR2		Same as CR1.	5-7
CR3		SEMICONDUCTOR: MIL type 1N3064.	5-7
CR4 thru CR10		Same as CR3.	5-7
CR11		Same as CR1.	5-7
CR12		Same as CR3.	5-7
CR13		Same as CR3.	5-7
CR14		Same as CR3.	5-7
CR15		Same as CR3.	5-7
J1		JACK, TIP: Plastic body; beryllium copper spring contact, gold plated finish; brass terminal; color green; 42498 dwg A42494-1-5; 17117 type 4879-125-5.	5-7
L1		COIL, RF: MIL type MS90537-33.	5-7
L2		COIL, RF: MIL type MS90537-41.	5-7
L3		COIL, RF: MIL type **MS75008-28**.	5-7
L4		COIL, RF: MIL type MS90537-37.	5-7
L5		Same as L2.	5-7
Q1		TRANSISTOR: MIL type 2N2219.	5-7
Q2		TRANSISTOR: MIL type 2N930.	5-7
Q3		Same as Q1.	5-7
Q4		TRANSISTOR: MIL type 2N2905.	5-7
Q5		Same as Q2.	5-7
Q6		TRANSISTOR: MIL type 2N2907.	5-7
Q7		Same as Q2.	5-7
Q8		Same as Q2.	5-7
Q9		Same as Q2.	5-7
R1		RESISTOR: MIL type RC07GF102K.	5-7
R2		RESISTOR: MIL type RC07GF562K.	5-7
R3		Same as R1.	5-7
R4		RESISTOR: MIL type RC07GF273K.	5-7
R5		RESISTOR: MIL type RC07GF103K.	5-7
R6		RESISTOR: MIL type RC07GF101J.	5-7
R7		RESISTOR: MIL type RC07GF272K.	5-7
R8		RESISTOR: MIL type RJ11BP501.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A1A2 (cont)			
R9		RESISTOR: MIL type RC07GF221K.	5-7
R10		RESISTOR: MIL type RC07GF182K.	5-7
R11		Same as R5.	5-7
R12		Same as R5.	5-7
R13		RESISTOR: MIL type RC07GF180K.	5-7
R14		Same as R13.	5-7
R15		RESISTOR: MIL type RC07GF152K.	5-7
R16		RESISTOR: MIL type RC07GF681K.	5-7
R17		RESISTOR: MIL type RC07GF270K.	5-7
R18		Same as R7.	5-7
R19		RESISTOR: MIL type RC07GF153K.	5-7
R20		RESISTOR: MIL type RC07GF222K.	5-7
R21		Same as R1.	5-7
R22		RESISTOR: MIL type RC07GF334J.	5-7
R23		RESISTOR: MIL type RC07GF394J.	5-7
R24		RESISTOR: MIL type RC07GF273J.	5-7
R25		RESISTOR: MIL type RC07GF100K.	5-7
R26		RESISTOR: MIL type RC07GF471J.	5-7
R27		RESISTOR: MIL type RC07GF822J.	5-7
R28		RESISTOR: MIL type RC07GF270K.	5-7
R29		Same as R28.	5-7
R30		Same as R28.	5-7
R31		RESISTOR: MIL type **RC07GF472K.**	5-7
R32		RESISTOR: MIL type RJ24CX101.	5-7
T1		TRANSFORMER, AF: 2 windings; 50 MW primary input; primary and secondary windings 10,000 ohms porm 10 pct impedance and center tapped; 42498 dwg A43450-1.	5-7
T2		TRANSFORMER, RF: 2 windings, primary winding 20 uh porm 20 pct at 25 deg C, 50 ohms impedance, 0 ma, 0.3 ohm dc resistance; secondary winding 200 ohms impedance, 0 ma, 0.2 ohm dc resistance; 42498 dwg A45391-1.	5-7
T3		Same as T2.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A2A1 (cont)			
R15		RESISTOR: MIL type RC07GF680J.	5-6
R16		RESISTOR: MIL type RC05GF563K.	5-6
R17		Same as R1.	5-6
R18		RESISTOR: MIL type RC05GF392K.	5-6
R19		RESISTOR: MIL type RC05GF101J.	5-6
R20		RESISTOR: MIL type RC05GF682K.	5-6
R21		RESISTOR: MIL type RC05GF181J.	5-6
R22		RESISTOR: MIL type RC05GF183K.	5-6
R23		RESISTOR: MIL type RC05GF123K.	5-6
R24		RESISTOR: MIL type RC05GF122K.	5-6
R25		RESISTOR: MIL type RC05GF151K.	5-6
R26		RESISTOR: MIL type RC05GF152K.	5-6
R27		RESISTOR: MIL type RC05GF103J.	5-6
R28		Same as R27.	5-6
R29		RESISTOR: MIL type RC05GF100K.	5-6
R30		Same as R29.	5-6
R31		Same as R7.	5-6

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A2A2		MODULATOR SUBASSEMBLY NO. 2: Same as A1A2.	5-5
C1		CAPACITOR: MIL type CS13BF105K.	5-7
C2		CAPACITOR: MIL type CK06BX104K.	5-7
C3		CAPACITOR: MIL type CK06CW222K.	5-7
C4		Same as C2.	5-7
C5		CAPACITOR: MIL type CS13BD157K.	5-7
C6		Same as C2.	5-7
C7		Same as C2.	5-7
C8		CAPACITOR: MIL type CS13BE336K.	5-7
C9		CAPACITOR: MIL type CK05CW103K.	5-7
C10		Same as C2.	5-7
C11		Same as C2.	5-7
C12		CAPACITOR: MIL type CS13BF476K.	5-7
C13		CAPACITOR: MIL type CS13BF685K.	5-7
C14		Same as C5.	5-7
C15		Same as C2.	5-7
C16		Same as C2.	5-7
C17		CAPACITOR: MIL type CK05BX102K.	5-7
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-7
CR2		Same as CR1.	5-7
CR3		SEMICONDUCTOR: MIL type 1N3064.	5-7
CR4 thru CR10		Same as CR3.	5-7
CR11		Same as CR1.	5-7
CR12		Same as CR3.	5-7
CR13		Same as CR3.	5-7
CR14		Same as CR3.	5-7
CR15		Same as CR3.	5-7
J1		JACK, TIP: Plastic body; beryllium copper spring contact, gold plated finish; brass terminal; color green; 42498 dwg A42494-1-5; 17117 type 4879-125-5.	5-7
L1		COIL, RF: MIL type MS90537-33.	5-7
L2		COIL, RF: MIL type MS90537-41.	5-7
L3		COIL, RF: MIL type **MS75008-28.**	5-7
L4		COIL, RF: MIL type MS90537-37.	5-7
L5		Same as L2.	5-7
Q1		TRANSISTOR: MIL type 2N2219.	5-7
Q2		TRANSISTOR: MIL type 2N930.	5-7
Q3		Same as Q1.	5-7
Q4		TRANSISTOR: MIL type 2N2905.	5-7
Q5		Same as Q2	5-7
Q6		TRANSISTOR: MIL type 2N2907.	5-7
Q7		Same as Q2.	5-7
Q8		Same as Q2.	5-7
Q9		Same as Q2.	5-7
R1		RESISTOR: MIL type RC07GF102K.	5-7
R2		RESISTOR: MIL type RC07GF562K.	5-7
R3		Same as R1.	5-7
R4		RESISTOR: MIL type RC07GF273K.	5-7
R5		RESISTOR: MIL type RC07GF103K.	5-7
R6		RESISTOR: MIL type RC07GF101J.	5-7
R7		RESISTOR: MIL type RC07GF272K.	5-7
R8		RESISTOR: MIL type RJ11BP501.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A2A2 (cont)			
R9		RESISTOR: MIL type RC07GF221K.	5-7
R10		RESISTOR: MIL type RC07GF182K.	5-7
R11		Same as R5.	5-7
R12		Same as R5.	5-7
R13		RESISTOR: MIL type RC07GF180K.	5-7
R14		Same as R13.	5-7
R15		RESISTOR: MIL type RC07GF152K.	5-7
R16		RESISTOR: MIL type RC07GF681K.	5-7
R17		RESISTOR: MIL type RC07GF270K.	5-7
R18		Same as R7.	5-7
R19		RESISTOR: MIL type RC07GF153K.	5-7
R20		RESISTOR: MIL type RC07GF222K.	5-7
R21		Same as R1.	5-7
R22		RESISTOR: MIL type RC07GF334J.	5-7
R23		RESISTOR: MIL type RC07GF394J.	5-7
R24		RESISTOR: MIL type RC07GF273J.	5-7
R25		RESISTOR: MIL type RC07GF100K.	5-7
R26		RESISTOR: MIL type RC07GF471J.	5-7
R27		RESISTOR: MIL type RC07GF822J.	5-7
R28		RESISTOR: MIL type RC07GF270K.	5-7
R29		Same as R28.	5-7
R30		Same as R28.	5-7
R31		RESISTOR: MIL type **RC07GF472K.**	5-7
R32		RESISTOR: MIL type RJ24CX101.	5-7
T1		TRANSFORMER, AF: 2 windings; 50 MW primary input; primary and secondary windings 10,000 ohms porm 10 pct impedance and center tapped; 42498 dwg A43450-1.	5-7
T2		TRANSFORMER, RF: 2 windings, primary winding 20 uh porm 20 pct at 25 deg C, 50 ohms impedance, 0 ma, 0.3 ohm dc resistance; secondary winding 200 ohms impedance, 0 ma, 0.2 ohm dc resistance; 42498 dwg A45391-1.	5-7
T3		Same as T2.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A3		MODULATOR ASSEMBLY: Same as A1.	5-2
P1		CONNECTOR: MIL type MS18176-1.	5-5

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A3A2		MODULATOR SUBASSEMBLY NO. 2: Same as A1A2.	5-5
C1		CAPACITOR: MIL type CS13BF105K.	5-7
C2		CAPACITOR: MIL type CK06BX104K.	5-7
C3		CAPACITOR: MIL type CK06CW222K.	5-7
C4		Same as C2.	5-7
C5		CAPACITOR: MIL type CS13BD157K.	5-7
C6		Same as C2.	5-7
C7		Same as C2.	5-7
C8		CAPACITOR: MIL type CS13BE336K.	5-7
C9		CAPACITOR: MIL type CK05CW103K.	5-7
C10		Same as C2.	5-7
C11		Same as C2.	5-7
C12		CAPACITOR: MIL type CS13BF476K.	5-7
C13		CAPACITOR: MIL type CS13BF685K.	5-7
C14		Same as C5.	5-7
C15		Same as C2.	5-7
C16		Same as C2.	5-7
C17		CAPACITOR: MIL type CK05BX102K.	5-7
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-7
CR2		Same as CR1.	5-7
CR3		SEMICONDUCTOR: MIL type 1N3064.	5-7
CR4 thru CR10		Same as CR3.	5-7
CR11		Same as CR1.	5-7
CR12		Same as CR3.	5-7
CR13		Same as CR3.	5-7
CR14		Same as CR3.	5-7
CR15		Same as CR3.	5-7
J1		JACK, TIP: Plastic body; beryllium copper spring contact, gold plated finish; brass terminal; color green; 42498 dwg A42494-1-5; 17117 type 4879-125-5.	5-7
L1		COIL, RF: MIL type MS90537-33.	5-7
L2		COIL, RF: MIL type MS90537-41.	5-7
L3		COIL, RF: MIL type MS75008-28.	5-7
L4		COIL, RF: MIL type MS90537-37.	5-7
L5		Same as L2.	5-7
Q1		TRANSISTOR: MIL type 2N2219.	5-7
Q2		TRANSISTOR: MIL type 2N930.	5-7
Q3		Same as Q1.	5-7
Q4		TRANSISTOR: MIL type 2N2905.	5-7
Q5		Same as Q2.	5-7
Q6		TRANSISTOR: MIL type 2N2907.	5-7
Q7		Same as Q2.	5-7
Q8		Same as Q2.	5-7
Q9		Same as Q2.	5-7
R1		RESISTOR: MIL type RC07GF102K.	5-7
R2		RESISTOR: MIL type RC07GF562K.	5-7
R3		Same as R1.	5-7
R4		RESISTOR: MIL type RC07GF273K.	5-7
R5		RESISTOR: MIL type RC07GF103K.	5-7
R6		RESISTOR: MIL type RC07GF101J.	5-7
R7		RESISTOR: MIL type RC07GF272K.	5-7
R8		RESISTOR: MIL type RJ11BP501.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A3A2 (cont)			
R9		RESISTOR: MIL type RC07GF221K.	5-7
R10		RESISTOR: MIL type RC07GF182K.	5-7
R11		Same as R5.	5-7
R12		Same as R5.	5-7
R13		RESISTOR: MIL type RC07GF180K.	5-7
R14		Same as R13.	5-7
R15		RESISTOR: MIL type RC07GF152K.	5-7
R16		RESISTOR: MIL type RC07GF681K.	5-7
R17		RESISTOR: MIL type RC07GF270K.	5-7
R18		Same as R7.	5-7
R19		RESISTOR: MIL type RC07GF153K.	5-7
R20		RESISTOR: MIL type RC07GF222K.	5-7
R21		Same as R1.	5-7
R22		RESISTOR: MIL type RC07GF334J.	5-7
R23		RESISTOR: MIL type RC07GF394J.	5-7
R24		RESISTOR: MIL type RC07GF273J.	5-7
R25		RESISTOR: MIL type RC07GF100K.	5-7
R26		RESISTOR: MIL type RC07GF471J.	5-7
R27		RESISTOR: MIL type RC07GF822J.	5-7
R28		RESISTOR: MIL type RC07GF270K.	5-7
R29		Same as R28.	5-7
R30		Same as R28.	5-7
R31		RESISTOR: MIL type **RC07GF472K.**	5-7
R32		RESISTOR: MIL type RJ24CX101.	5-7
T1		TRANSFORMER, AF: 2 windings; 50 MW primary input; primary and secondary windings 10,000 ohms porm 10 pct impedance and center tapped; 42498 dwg A43450-1.	5-7
T2		TRANSFORMER, RF: 2 windings, primary winding 20 uh porm 20 pct at 25 deg C, 50 ohms impedance, 0 ma, 0.3 ohm dc resistance; secondary winding 200 ohms impedance, 0 ma, 0.2 ohm dc resistance; 42498 dwg A45391-1.	5-7
T3		Same as T2.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A4A1 (cont)			
R15		RESISTOR: MIL type RC07GF680J.	5-6
R16		RESISTOR: MIL type RC05GF563K.	5-6
R17		Same as R1.	5-6
R18		RESISTOR: MIL type RC05GF392K.	5-6
R19		RESISTOR: MIL type RC05GF101J.	5-6
R20		RESISTOR: MIL type RC05GF682K.	5-6
R21		RESISTOR: MIL type RC05GF181J.	5-6
R22		RESISTOR: MIL type RC05GF183K.	5-6
R23		RESISTOR: MIL type RC05GF123K.	5-6
R24		RESISTOR: MIL type RC05GF122K.	5-6
R25		RESISTOR: MIL type RC05GF151K.	5-6
R26		RESISTOR: MIL type RC05GF152K.	5-6
R27		RESISTOR: MIL type RC05GF103J.	5-6
R28		Same as R27.	5-6
R29		RESISTOR: MIL type RC05GF100K.	5-6
R30		Same as R29.	5-6
R31		Same as R7.	5-6

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A4A2		MODULATOR SUBASSEMBLY NO. 2: Same as A1A2.	5-5
C1		CAPACITOR: MIL type CSl3BF105K.	5-7
C2		CAPACITOR: MIL type CK06BX104K.	5-7
C3		CAPACITOR: MIL type CK06CW222K.	5-7
C4		Same as C2.	5-7
C5		CAPACITOR: MIL type CSl3BD157K.	5-7
C6		Same as C2.	5-7
C7		Same as C2.	5-7
C8		CAPACITOR: MIL type CSl3BE336K.	5-7
C9		CAPACITOR: MIL type CK05CW103K.	5-7
C10		Same as C2.	5-7
C11		Same as C2.	5-7
C12		CAPACITOR: MIL type CSl3BF476K.	5-7
C13		CAPACITOR: MIL type CSl3BF685K.	5-7
C14		Same as C5.	5-7
C15		Same as C2.	5-7
C16		Same as C2.	5-7
C17		CAPACITOR: MIL type CK05BX102K.	5-7
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-7
CR2		Same as CR1.	5-7
CR3		SEMICONDUCTOR: MIL type 1N3064.	5-7
CR4 thru CR10		Same as CR3.	5-7
CR11		Same as CR1.	5-7
CR12		Same as CR3.	5-7
CR13		Same as CR3.	5-7
CR14		Same as CR3.	5-7
CR15		Same as CR3.	5-7
J1		JACK, TIP: Plastic body; beryllium copper spring contact, gold plated finish; brass terminal; color green; 42498 dwg A42494-1-5; 17117 type 4879-125-5.	5-7
L1		COIL, RF: MIL type MS90537-33.	5-7
L2		COIL, RF: MIL type MS90537-41.	5-7
L3		COIL, RF: MIL type **MS75008-28**.	5-7
L4		COIL, RF: MIL type MS90537-37.	5-7
L5		Same as L2.	5-7
Q1		TRANSISTOR: MIL type 2N2219.	5-7
Q2		TRANSISTOR: MIL type 2N930.	5-7
Q3		Same as Q1.	5-7
Q4		TRANSISTOR: MIL type 2N2905.	5-7
Q5		Same as Q2.	5-7
Q6		TRANSISTOR: MIL type 2N2907.	5-7
Q7		Same as Q2.	5-7
Q8		Same as Q2.	5-7
Q9		Same as Q2.	5-7
R1		RESISTOR: MIL type RC07GF102K.	5-7
R2		RESISTOR: MIL type RC07GF562K.	5-7
R3		Same as R1.	5-7
R4		RESISTOR: MIL type RC07GF273K.	5-7
R5		RESISTOR: MIL type RC07GF103K.	5-7
R6		RESISTOR: MIL type RC07GF101J.	5-7
R7		RESISTOR: MIL type RC07GF272K.	5-7
R8		RESISTOR: MIL type RJ11BP501.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A4A2 (cont)			
R9		RESISTOR: MIL type RC07GF221K.	5-7
R10		RESISTOR: MIL type RC07GF182K.	5-7
R11		Same as R5.	5-7
R12		Same as R5.	5-7
R13		RESISTOR: MIL type RC07GF180K.	5-7
R14		Same as R13.	5-7
R15		RESISTOR: MIL type RC07GF152K.	5-7
R16		RESISTOR: MIL type RC07GF681K.	5-7
R17		RESISTOR: MIL type RC07GF270K.	5-7
R18		Same as R7.	5-7
R19		RESISTOR: MIL type RC07GF153K.	5-7
R20		RESISTOR: MIL type RC07GF222K.	5-7
R21		Same as R1.	5-7
R22		RESISTOR: MIL type RC07GF334J.	5-7
R23		RESISTOR: MIL type RC07GF394J.	5-7
R24		RESISTOR: MIL type RC07GF273J.	5-7
R25		RESISTOR: MIL type RC07GF100K.	5-7
R26		RESISTOR: MIL type RC07GF471J.	5-7
R27		RESISTOR: MIL type RC07GF822J.	5-7
R28		RESISTOR: MIL type RC07GF270K.	5-7
R29		Same as R28.	5-7
R30		Same as R28.	5-7
R31		RESISTOR: MIL type **RC07GF472K.**	5-7
R32		RESISTOR: MIL type RJ24CX101.	5-7
T1		TRANSFORMER, AF: 2 windings; 50 MW primary input; primary and secondary windings 10,000 ohms porm 10 pct impedance and center tapped; 42498 dwg A43450-1.	5-7
T2		TRANSFORMER, RF: 2 windings, primary winding 20 uh porm 20 pct at 25 deg C, 50 ohms impedance, 0 ma, 0.3 ohm dc resistance; secondary winding 200 ohms impedance, 0 ma, 0.2 ohm dc resistance; 42498 dwg A45391-1.	5-7
T3		Same as T2.	5-7

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A5		VOICE FREQUENCY GATE AND KEYLINE SWITCH SUBASSEMBLY: Contained on one printed circuit card; VFG circuit provides voice controlled transmission (VOX) by disabling the carrier and modulator circuits; muting the RF (external) power amplifier, and opening and closing the keyline circuit in response to the presence or absence of voice modulation; an adjustable delay (100 microseconds to 3 seconds) prevents the carrier from being turned off during speech pauses; 42498 dwg D44745G1.	5-2
C1		CAPACITOR: MIL type CK06CW103K.	5-8
C2		CAPACITOR: MIL type CK06BX104K.	5-8
C3		CAPACITOR: MIL type CS13BF685K.	5-8
C4		Same as C3.	5-8
C5		CAPACITOR: MIL type CS13BF106K.	5-8
C6		CAPACITOR: MIL type CK06CW472K.	5-8
C7		Same as C3.	5-8
C8		Same as C3.	5-8
C9		Same as C3.	5-8
C10		CAPACITOR: MIL type CS13BF476K.	5-8
C11		Same as C1.	5-8
C12		CAPACITOR: MIL type CL65BH151MP3.	5-8
CR1		SEMICONDUCTOR: MIL type 1N914.	5-8
CR2 thru CR9		Same as CR1.	5-8
K1		RELAY, RESONANT REED: 3.0 kHz resonant frequency; DP normally open; 0.5 amp, 250 vdc; 42498 dwg A44195-1; 12965 type MG-2A.	5-8
L1		COIL, RF: MIL type MS90537-45.	5-8
Q1		TRANSISTOR: MIL type 2N2222A.	5-8
Q2		TRANSISTOR: MIL type 2N2323A.	5-8
Q3		Same as Q1.	5-8
Q4		TRANSISTOR: MIL type 2N491A.	5-8
Q5 thru Q9		Same as Q1.	5-8
Q10		TRANSISTOR: MIL type 2N2219.	5-8
Q11		TRANSISTOR: MIL type 2N2905.	5-8
Q12		TRANSISTOR: MIL type 2N2907.	5-8
R1		RESISTOR: MIL type RC07GF155K.	5-8
R2		RESISTOR: MIL type RC07GF684K.	5-8
R3		RESISTOR: MIL type RC07GF271K.	5-8
R4		RESISTOR: MIL type RC07GF103K.	5-8
R5		RESISTOR: MIL type RC07GF471K.	5-8
R6		RESISTOR: MIL type RC07GF472K.	5-8
R7		RESISTOR: MIL type RC07GF101K.	5-8
R8		RESISTOR: MIL type RC07GF222K.	5-8
R9		RESISTOR: MIL type RT12C2P502.	5-8
R10		RESISTOR: MIL type RC07GF181K.	5-8
R11		RESISTOR: MIL type RC07GF122K.	5-8
R12		RESISTOR: MIL type RC07GF221K.	5-8
R13		Same as R8.	5-8
R14		Same as R8.	5-8
R15		RESISTOR: MIL type RC07GF473K.	5-8
R16		RESISTOR: MIL type RC07GF182K.	5-8
R17		Same as R4.	5-8

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A7A2		PRINTED CIRCUIT BOARD SUBASSEMBLY, 30 MHz OSC/BUFFER: 42498 dwg D46236G1.	5-10
C1		CAPACITOR: MIL type CK05CW102K.	5-12
C2		Same as C1.	5-12
C3		Same as C1.	5-12
C4		CAPACITOR: MIL type CM05CD050D03.	5-12
C5		CAPACITOR: MIL type CM05ED240J03.	5-12
C6		CAPACITOR: MIL type CM05FD181J03.	5-12
C7 thru C9		Same as C1.	5-12
C10		CAPACITOR: MIL type CK05CW470K.	5-12
C11		Same as C10.	5-12
C12		Same as C10.	5-12
C13		CAPACITOR: MIL type CM05ED270J03.	5-12
C14		Same as C1.	5-12
C15 thru C18		Same as C1.	5-12
CR1		SEMICONDUCTOR: Silicon; JEDEC case style DO-14; 42498 dwg A43737-3; 01281 type PC1251.	5-12
L1		COIL, RF: MIL type MS90537-29.	5-12
L2		Same as L1.	5-12
Q1		TRANSISTOR: MIL type 2N918.	5-12
Q2		Same as Q1.	5-12
Q3		TRANSISTOR: P-N-P polarity; JEDEC case style TO-18; 42498 dwg A43085-1; 14433 type TS1847.	5-12
Q4		TRANSISTOR: MIL type 2N2222.	5-12
Q5		Same as Q4.	5-12
Q6		Same as Q4.	5-12
R1		**RESISTOR: MIL type RC07GF103K.**	5-12
R2		**RESISTOR: MIL type RC07GF272K.**	5-12
R3		**RESISTOR: MIL type RC07GF822K.**	5-12
R4		**RESISTOR: MIL type RC07GF562K.**	5-12
R5		**Same as R2.**	5-12
R6		**RESISTOR: MIL type RC07GF561K.**	5-12
R7		**RESISTOR: MIL type RC07GF301K.**	5-12
R8		**Same as R1.**	5-12
R9		**RESISTOR: MIL type RC07GF182K.**	5-12
R10		**RESISTOR: MIL type RC07GF471K.**	5-12
R11		**Same as R3.**	5-12
R12		**RESISTOR: MIL type RC07GF122K.**	5-12
R13		Same as R3.	5-12
R14		Same as R12.	5-12
R15		Same as R3.	5-12
R16		Same as R12.	5-12
R17		**RESISTOR: MIL type RC07GF102K.**	5-12
R18		**RESISTOR: MIL type RC07GF221K.**	5-12
R19		Same as R17.	5-12
R20		Same as R18.	5-12
R21		Same as R17	5-12
R22		Same as R18	5-12
Y1		CRYSTAL UNIT, QUARTZ: 30.000000 MHz, porm .005 pct frequency stability, 20 pf load capacitance, 30 ohms max resistance, fundamental, parallel mode of oscillation; 42498 dwg A46436-1.	5-12

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A7A3		PRINTED CIRCUIT BOARD SUBASSEMBLY, 30 MHz PHASE LOCKED LOOP: 42498 dwg D46231G1.	5-10
C1		CAPACITOR: MIL type CK05CW102K.	5-13
C2		CAPACITOR: MIL type CS13BC396K.	5-13
C3		Same as C1.	5-13
C4		CAPACITOR: MIL type CK06CW103K.	5-13
C5		Same as C4.	5-13
C6		CAPACITOR: MIL type CS13BE156K.	5-13
C7		Same as C2.	5-13
C8		Same as C4.	5-13
C9		Same as C4.	5-13
C10		Same as C2.	5-13
C11		Same as C4.	5-13
L1		COIL: MIL type MS75008-44	5-13
Q1		TRANSISTOR: MIL type 2N2907.	5-13
Q2		Same as Q1.	5-13
Q3		TRANSISTOR: MIL type 2N2222.	5-13
R1		RESISTOR: MIL type RC07GF102K.	5-13
R2		RESISTOR: MIL type RC07GF472K.	5-13
R3		RESISTOR: MIL type RC07GF271K.	5-13
R4		RESISTOR: MIL type RC07GF222K.	5-13
R5		Same as R2.	5-13
R6		RESISTOR: MIL type RC07GF471K.	5-13
R7		Same as R6.	5-13
R8		Same as R6.	5-13
R9		RESISTOR: MIL type RC07GF683K.	5-13
R10		RESISTOR: MIL type RC07GF391K.	5-13
R11		RESISTOR: MIL type RC07GF103K.	5-13
R12		RESISTOR: MIL type RC07GF820K.	5-13
R13		RESISTOR: MIL type RC07GF221K.	5-13
R14		RESISTOR: MIL type RC07GF122K.	5-13
R15		Same as R14.	5-13
R16		Same as R4.	5-13
R17		RESISTOR: MIL type RC07GF562K.	5-13
Z1		INTEGRATED CIRCUIT, FLIP FLOP: 70 MHz, ac coupled JK flip flop, minus 10 vdc, 20 ma; 42498 dwg B44548G2.	5-13
Z2		INTEGRATED CIRCUIT, FLIP FLOP: High speed flip flop plus 8.0v continuous supply voltage, plus 12v pulsed supply voltage, minus 10 ma forward input current, 5.0 ma reverse input current, minus 1.0v or plus 8.0v input voltage; 42498 dwg A47728-1; 14433 type MIC950-3D.	5-13
Z3 thru Z6		Same as Z2.	5-13
Z7		INTEGRATED CIRCUIT, LOGIC GATE: Quadruple 2-input gate; 3.0-4.0v operating voltage; 50 nsec propagation delay; 0.6v noise margin; 8/gate fanout; 5 MW/gate power dissipation; 42498 dwg A44457-2; 14433 type MIC946-3D.	5-13

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A8		1.75 MHz-113.75 MHz GENERATOR ASSEMBLY: Contains two separate but functionally related circuits; develops the 1.75 MHz frequency for use by the channel A1 and B1 modulators, and the 113.75 MHz generator circuitry; the 113.75 generator develops the 113.75 MHz frequency used by the up-converter from the 1.75 MHz signal delivered by the 1.75 MHz generator; 42498 dwg D44126G1.	5-1
P1		CONNECTOR: MIL type MS18176-1.	5-14

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A8A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, 113.75 MHz GENERATOR: 42498 dwg D44000G1.	5-14
C1		CAPACITOR: MIL type CK05CW102K.	5-15
C2		Same as C1.	5-15
C3		Same as C1.	5-15
C4		CAPACITOR: MIL type CK06BX104K.	5-15
C5		Same as C1.	5-15
C6		CAPACITOR: MIL type CM05FC121J03.	5-15
C7		CAPACITOR: MIL type CM05FC050J03.	5-15
C8		Same as C6.	5-15
C9		Same as C1.	5-15
C10		Same as C1.	5-15
C11		CAPACITOR, VARIABLE, CERAMIC: 3.0-15.0 pf, 200 vdc;42498 dwg A42545-9; 72982 type 538-016-E2P0-110R.	5-15
C12		CAPACITOR: MIL type CS13BC396K.	5-15
C13		CAPACITOR: MIL type CK06CW103K.	5-15
C14		Same as C13.	5-15
C15		Same as C13.	5-15
C16		CAPACITOR: MIL type CS13BF156K.	5-15
C17		CAPACITOR: MIL type CM05C100K03.	5-15
C18		CAPACITOR: MIL type CM05F680J03.	5-15
C19		CAPACITOR: MIL type CK05CW681K.	5-15
C20 thru C23		Same as C1.	5-15
C24		CAPACITOR: MIL type CM05E360J03.	5-15
C25		CAPACITOR: MIL type **CM05ED680J03**	5-15
C26		Same as C1.	5-15
C27		CAPACITOR: MIL type CS13BH224K.	5-15
C28		CAPACITOR: MIL type CM05E221J03.	5-15
C29		CAPACITOR: MIL type CM05E101J03.	5-15
C30		Same as C13.	5-15
C31		Same as C29.	5-15
C32		CAPACITOR: MIL type CS13BF105K.	5-15
C33		CAPACITOR: MIL type CM05E151J03.	5-15
C34		CAPACITOR: MIL type CM05E330J03.	5-15
C35		CAPACITOR: MIL type CC20UJ560G.	5-15
C36		CAPACITOR: MIL type CB11RD221K.	5-15
C37		Same as C1.	5-15
C38		Same as C1.	5-15
C39		CAPACITOR: MIL type CK05CW271K.	5-15
C40		Same as C39.	5-15
C41		Same as C4.	5-15
CR1		SEMICONDUCTOR: MIL type 1N914.	5-15
CR2		SEMICONDUCTOR: P-N-P-N 4 layer polarity; 42498 dwg A43736-1; 04713 type M4L3053.	5-15
CR3		SEMICONDUCTOR: Silicon; JEDEC case style DO-14; 42498 dwg A43737-3; 01281 type PC1251.	5-15
J1		JACK, TIP: 1,000V RMS; nylon body; gold plated contacts; color red; 42498 dwg A47778-2; 00779 type 3-582340-2.	5-15
L1		COIL, RF: 0.31 uh, Q 50 at 8.1 MHz, 150 ma, 185 MHz min self resonant frequency, 0.46 ohm dc resistance; 42498 dwg A43469-17.	5-15

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A8A1 (cont)			
L2		COIL, RF: MIL type MS90537-45.	5-15
L3		COIL, RF: MIL type MS90537-33.	5-15
L4		COIL, RF: 117 MHz, 1,000 ma, 0.01 ohm dc resistance 400 MHz min self resonant frequency; 42498 dwg A42818-3.	5-15
Q1		TRANSISTOR: P-N-P polarity; JEDEC case style TO-18; 42498 dwg A43085-1; 14433 type TS1847.	5-15
Q2		TRANSISTOR: MIL type 2N2857.	5-15
Q3		TRANSISTOR: MIL type 2N2907.	5-15
Q4		TRANSISTOR: MIL type 2N2222.	5-15
Q5		Same as Q1.	5-15
Q6		Same as Q1.	5-15
Q7		Same as Q2.	5-15
Q8		Same as Q1.	5-15
Q9		Same as Q2.	5-15
Q10		Same as Q4.	5-15
Q11		Same as Q1.	5-15
Q12		TRANSISTOR: MIL type 2N708.	5-15
Q13		Same as Q1.	5-15
R1		**RESISTOR: MIL type RC07GF222J.**	5-15
R2		**NOT USED**	5-15
R3		**RESISTOR: MIL RC07GF151J.**	5-15
R4		Same as R1.	5-15
R5		**RESISTOR: MIL type RC07GF470J.**	5-15
R6		Same as R2.	5-15
R7		**RESISTOR: MIL type RC07GF103J.**	5-15
R8		Same as R7.	5-15
R9		**RESISTOR: MIL type RC07GF122J.**	5-15
R10		Same as R7.	5-15
R11		Same as R7.	5-15
R12		Same as R9.	5-15
R13		**RESISTOR: MIL type RC07GF561J.**	5-15
R14		Same as R13.	5-15
R15		**RESISTOR: MIL type RC07GF821J.**	5-15
R16		**RESISTOR: MIL type RC07GF560J.**	5-15
R17		**RESISTOR: MIL type RC07GF101J.**	5-15
R18		Same as R13.	5-15
R19		**RESISTOR: MIL type RC07GF102J.**	5-15
R20		Same as R19.	5-15
R21		**RESISTOR: MIL type RC07GF471J.**	5-15
R22		**RESISTOR: MIL type RC07GF221J.**	5-15
R23		**RESISTOR: MIL type RC07GF183J.**	5-15
R24		Same as R7.	5-15
R25		**RESISTOR: MIL type RC07GF472J.**	5-15
R26		Same as R22.	5-15
R27		Same as R15.	5-15
R28		Same as R3.	5-15
R29		**RESISTOR: MIL type RC07GF391J.**	5-15
R30		Same as R3.	5-15
R31		**RESISTOR: MIL type RC07GF332J.**	5-15
R32		Same as R7.	5-15
R33		**RESISTOR: MIL type RC07GF681J.**	5-15

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A8A1 (cont)			
R34		RESISTOR: MIL type **RC07GF271J.**	5-15
R35		Same as R34.	5-15
R36		Same as R5.	5-15
R37		RESISTOR: MIL type **RC07GF682J.**	5-15
R38		Same as R17.	5-15
R39		Same as R7.	5-15
R40		RESISTOR: MIL type **RC07GF392J.**	5-15
R41		Same as R7.	5-15
R42		Same as R29.	5-15
R43		Same as R3.	5-15
R44		RESISTOR: MIL type **RC07GF272J.**	5-15
R45		Same as R29.	5-15
R46		RESISTOR: MIL type **RC07GF331J.**	5-15
R47		Same as R16.	5-15
R48		Same as R7.	5-15
R49		RESISTOR: MIL type **RC07GF393J.**	5-15
R50		Same as R19.	5-15
R51		Same as R16.	5-15
R52		RESISTOR: MIL type **RC07GF121J.**	5-15
R53		Same as R7.	5-15
R54		Same as R7.	5-15
R55		Same as R13.	5-15
T1		TRANSFORMER, RF: 2 windings; primary winding 0.31 uh, Q 95 at 25 MHz, 160 MHz min self resonant frequency, 150 ma, 0.16 ohm dc resistance; secondary winding 0.46 ohm dc resistance; 42498 dwg A45384-2.	5-15
T2		TRANSFORMER, RF: 2 windings; primary winding 0.12 uh, 250 MHz min self resonant frequency, 22 ma, 0.1 ohm dc resistance; secondary winding 0.03 ohm dc resistance; 42498 dwg A42748-1.	5-15
T3		TRANSFORMER, RF: 2 windings; primary winding 9 uh, 28 MHz min self-resonant frequency, 100 ma, 0.4 ohm dc resistance; secondary winding 0.2 ohm dc resistance; 42498 dwg A42819-5.	5-15
Z1		INTEGRATED CIRCUIT, FLIP FLOP: 2.7v output high voltage, 0.4v output low voltage, 1.7v input high voltage, 0.9v input low voltage; 42498 dwg A45732-1; 14433 type TTUL9001.	5-15
Z2		Same as Z1.	5-15
Z3		MIXER, RF: F1 input 112 MHz, F2 input 117 MHz, F3 output 5 MHz, 50 ohms dc resistance; 42498 dwg A42962-5.	5-15
Z4		MIXER, RF: F1 input 15 MHz, F2 input 10 MHz, F3 output 5 MHz, 50 ohms dc resistance; 42498 dwg A42962-2.	5-15

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A8A2		PRINTED CIRCUIT BOARD SUBASSEMBLY, 1.75 MHz GENERATOR: 42498 dwg D43919G1.	5-14
C1		CAPACITOR: MIL type CS13BE156K.	5-16
C2 thru C4		Same as C1.	5-16
C5		CAPACITOR: MIL type CS13BC396K.	5-16
C6		CAPACITOR: MIL type CM05FC101J03.	5-16
C7		CAPACITOR: MIL type CM05FC331J03.	5-16
C8		CAPACITOR: MIL type CM05FC050J03.	5-16
C9		Same as C7.	5-16
C10		CAPACITOR: MIL type CK06BX104K.	5-16
C11		CAPACITOR: MIL type CK06CW103K.	5-16
C12		Same as C5.	5-16
C13		CAPACITOR: MIL type CM06FC272J03.	5-16
C14		Same as C10.	5-16
C15		Same as C10.	5-16
L1		COIL, RF: 6.3 uh, Q 50 at 7.9 MHz, 18 MHz min self resonant frequency, 40 ma, 0.5 ohm dc resistance; 42498 dwg A45381-5.	5-16
L2		COIL, RF: 6.3 uh, Q 50 at 7.9 MHz, 18 MHz min self resonant frequency, 40 ma, 0.5 ohm dc resistance; tapped; 42498 dwg A45381-6.	5-16
Q1		TRANSISTOR: MIL type 2N2222.	5-16
Q2 thru Q6		Same as Q1.	5-16
Q7		TRANSISTOR: MIL type 2N2219.	5-16
R1		RESISTOR: MIL type RC07GF102K.	5-16
R2		RESISTOR: MIL type RC07GF682K.	5-16
R3		RESISTOR: MIL type RC07GF561K.	5-16
R4		Same as R3.	5-16
R5		RESISTOR: MIL type RC07GF471K.	5-16
R6		Same as R1.	5-16
R7		RESISTOR: MIL type RC07GF221K.	5-16
R8		RESISTOR: MIL type RC07GF331K.	5-16
R9		Same as R8.	5-16
R10		RESISTOR: MIL type RC07GF271K.	5-16
R11		RESISTOR: MIL type RC07GF222K.	5-16
R12		Same as R1.	5-16
R13		RESISTOR: MIL type RC07GF123K.	5-16
R14		RESISTOR: MIL type RC07GF562K.	5-16
R15		Same as R1.	5-16
R16		RESISTOR: MIL type RC07GF121K.	5-16
R17		RESISTOR: MIL type RC07GF151K.	5-16
R18		RESISTOR: MIL type RT22C2P101.	5-16
T1		Not used.	5-16
T2		TRANSFORMER, RF: 2 windings; primary winding 3.0 uh, Q 70 at 7.9 MHz, 50 MHz min self resonant frequency, 40 ma, 0.7 ohm dc resistance; secondary winding 0.3 ohm dc resistance; 42498 dwg A45384-1.	5-16
Y1		CRYSTAL: MIL type **CR85U1000000 MHz HC6U.**	5-16
Z1		INTEGRATED CIRCUIT, FLIP FLOP: R-S or J-K flip flop; 3.0-4.0v operating voltage; 50 nsec propagation delay; 0.6v noise margin; 9 fanout; 42 MW/gate power dissipation; 42498 dwg A44457-8; 14433 type MIC945-3D.	5-16
Z2		Same as Z1.	5-16

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A9		SIDE CARRIER GENERATOR ASSEMBLY: Develops injection frequencies for the A2 and B2 channel modulators through the combined operation of a divider circuit and an oscillator circuit from a 1 MHz standard frequency; 42498 dwg D44124G1.	5-1
P1		CONNECTOR: MIL type MS18176-1.	5-17

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A11A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, UP CONVERTER 1.75 MHz IF: 42498 dwg D44087G1.	5-21
C1		CAPACITOR: MIL type CK06CW332K.	5-22
C2		CAPACITOR: MIL type CK06BX104K.	5-22
C3		Same as C2.	5-22
C4		CAPACITOR: MIL type CS13BF685K.	5-22
C5		Same as C2.	5-22
C6		CAPACITOR: MIL type CS13BF476K.	5-22
C7		Same as C2.	5-22
C8		Same as C4.	5-22
C9		CAPACITOR: MIL type CM05F241J03.	5-22
C10		CAPACITOR: MIL type CK05CW102K.	5-22
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-22
CR2		Same as CR1.	5-22
CR3		SEMICONDUCTOR: 250 pf porm 20 pct at minus 8 vdc bias and 1 MHz, Q 160 at 25 MHz; 42498 dwg A45712-?; **82716 type V4092.**	5-22
L1		COIL, RF: 100 uh, Q 80 at 790 kHz, 5.0 MHz min self resonant frequency 20 ma, 4.0 ohms dc resistance; 42498 dwg A45381-1.	5-22
L2		COIL, RF: MIL type MS90537-37.	5-22
L3		COIL, RF: MIL type MS90537-45.	5-22
L4		COIL, RF: 30 uh, Q 75 at 2.5 MHz, 8.0 MHz min self resonant frequency, 40 ma, 2.0 ohms dc resistance; 42498 dwg A45381-2.	5-22
Q1		TRANSISTOR: MIL type 2N2222.	5-22
Q2 thru Q4		Same as Q1.	5-22
Q5		TRANSISTOR: MIL type 2N3500.	5-22
Q6		TRANSISTOR: MIL type 2N2219.	5-22
Q7		Same as Q6.	5-22
R1		RESISTOR: MIL type RC07GF822K.	5-22
R2		RESISTOR: MIL type RC07GF392K.	5-22
R3		RESISTOR: MIL type RC07GF102K.	5-22
R4		RESISTOR: MIL type RC07GF562K.	5-22
R5		RESISTOR: MIL type RC07GF123K.	5-22
R6		RESISTOR, VARIABLE: 5,000 ohms, porm 5 pct, 0.5w; 42498 dwg A46445-7; 80294 type 3300P-1-502.	5-22
R7		RESISTOR: MIL type RC07GF332K.	5-22
R8		RESISTOR: MIL type RC07GF682K.	5-22
R9		Same as R1.	5-22
R10		Same as R6.	5-22
R11		Same as R8.	5-22
R12		RESISTOR: MIL type RC07GF472K.	5-22
R13		RESISTOR: MIL type RC32GF753J.	5-22
R14		RESISTOR: MIL type RC07GF821K.	5-22
R15		RESISTOR: MIL type RC07GF104K.	5-22
R16		RESISTOR: MIL type RC07GF394K.	5-22
R17		RESISTOR, VARIABLE: 50 ohms, porm 5 pct, 0.5w; 42498 dwg A46445-1; 80294 type 3300P-1-500.	5-22
R18		RESISTOR: MIL type RC07GF180K.	5-22
R19		RESISTOR: MIL type RC07GF271K.	5-22
R20		Same as R19.	5-22
R21		Same as R12.	5-22

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A11A1 (cont)			
R22		Same as R2.	5-22
R23		RESISTOR: MIL type RC07GF471K.	5-22
R24		Same as R12.	5-22
R25		Same as R2.	5-22
R26		Same as R23.	5-22

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A11A3		PRINTED CIRCUIT BOARD SUBASSEMBLY, UP CONVERTER CARRIER INSERTION: 42498 dwg D44091G1.	5-21
C1		CAPACITOR: MIL type CK06CW104K.	5-24
C2		Same as C1.	5-24
C3		CAPACITOR: MIL type CK06CW103K.	5-24
C4		CAPACITOR: MIL type CK05CW102K.	5-24
C5		CAPACITOR: MIL type CM06F471J03.	5-24
C6 thru C9		Same as C1.	5-24
CR1		SEMICONDUCTOR: MIL type 1N3064.	5-24
CR2 thru CR7		Same as CR1.	5-24
K1		RELAY: MIL type M5757-9-003.	5-24
K2 thru K5		Same as K1.	5-24
L1		COIL, RF: 20 uh, Q 20 at 2.5 MHz, 10 MHz min self resonant frequency, 60 ma, 0.8 ohm dc resistance; 42498 dwg A45381-4.	5-24
L2		COIL, RF: MIL type MS90537-57.	5-24
L3 thru L7		Same as L2.	5-24
Q1		TRANSISTOR: MIL type 2N2222.	5-24
R1		Not used.	
R2		RESISTOR: MIL type RC07GF822K.	5-24
R3		RESISTOR, VARIABLE: 500 ohms, porm 5 pct, 0.5w; 42498 dwg A46445-4; 80294 type 3300P-1-501.	5-24
R4		RESISTOR: MIL type RN60C1000F.	5-24
R5		Same as R4.	5-24
R6		Same as R2.	5-24
R7		RESISTOR: MIL type RC07GF152K.	5-24
R8		RESISTOR: MIL type **RC07GF391K.**	5-24
R9		RESISTOR, VARIABLE: 100 ohms, porm 5 pct, 0.5w; 42498 dwg A46445-2; 80294 type 3300P-1-101.	5-24
R10		RESISTOR: MIL type RN60C49R9F.	5-24
R11		RESISTOR: MIL type RC07GF182K.	5-24
R12		RESISTOR: MIL type RC07GF101K.	5-24
R13		RESISTOR: MIL type RC07GF820K.	5-24
R14		RESISTOR: MIL type RN60C86R6F.	5-24
R15		Same as R2.	5-24
R16		Same as R13.	5-24
R17		Same as R11.	5-24
R18		RESISTOR: MIL type RN60C1740F.	5-24
R19		Same as R11.	5-24
R20		RESISTOR: MIL type RN60C6040F.	5-24
R21		Same as R11.	5-24
R22		Same as R9.	5-24
R23		RESISTOR: MIL type RC07GF151K.	5-24
R24		RESISTOR, VARIABLE: 50 ohms, porm 5 pct, 0.5w; 42498 dwg A46445-1; 80294 type 3300P-1-500.	5-24
R25		RESISTOR: MIL type RC07GF301J.	5-24
R26		Same as R23.	5-24
R27		Same as R25.	5-24
R28		Same as R2.	5-24
R29		Same as R3.	5-24
R30		RESISTOR: MIL type RC07GF270K.	5-24
R31		Same as R30.	5-24

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A11A3 (cont)			
R32		Not used.	
R33		Not used.	
R34		Same as R12.	5-24
T1		TRANSFORMER, RF: 2 windings; primary winding 420 uh, 0 ma, 0.18 ohm dc resistance; secondary winding 0 ma, 0.18 ohm dc resistance; 42498 dwg A45481-1.	5-24
T2 thru T10		Same as T1.	5-24
T11		TRANSFORMER, RF: 2 windings; primary windings; primary winding 20 uh, porm 20 pct at 25 deg C at 1 MHz, 50 ohms impedance, 44 ma, 0.1 ohm dc resistance; secondary winding 200 ohms impedance, 22 ma, 0.2 ohm dc resistance; 42498 dwg A42745-1.	5-24
T12		TRANSFORMER, RF: 2 windings; primary winding 28 uh porm 20 pct at 25 deg C, 0 ma, 0.15 ohm dc resistance; secondary winding 0.20 ohm dc resistance; 42498 dwg A45387-1.	5-24

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12		SYNTHESIZER ASSEMBLY: Solid state module contains seven plug-in printed circuit cards, a total of 280,000 accurate injection frequencies, over a frequency range of 82 MHz to 110 MHz are generated by digital techniques; each frequency is derived from the 1 MHz frequency standard and exhibits the same degree of accuracy and stability as that of the standard; the module also supplies a 12.5 kHz synchronizing pulse to the power supply; 42498 dwg D43208G2.	5-1
C1		CAPACITOR: MIL type CK06BX104K.	5-25
C2		Same as C1.	5-25
C3		CAPACITOR: MIL type CK06CW103K.	5-25
C4		Same as C3.	5-25
C5		Same as C3.	5-25
C6		Same as C1.	5-25
C7		Same as C1.	5-25
C8		CAPACITOR: MIL type CK05CW102K.	5-25
C9		Not used.	
C10		Same as C1.	5-25
C11		Same as C8.	5-25
C12 thru C14		Not used.	
C15 thru C24		Same as C8.	5-25
C25 thru C29		Same as C1.	5-25
C30 thru C44		Same as C8.	5-25
C45		Same as C1.	5-25
CR1		SEMICONDUCTOR: MIL type 1N3828A.	5-25
L1		COIL, RF: MIL type MS90537-37.	5-25
L2 thru L4		Same as L1.	5-25
L5		COIL, RF: MIL type MS90537-17.	5-25
L6		Not used.	
L7		Same as L1.	5-25
L8		COIL, RF: MIL type MS90537-25	5-25
L9 thru L13		Same as L1.	5-25
L14		Coil, RF: MIL type MS90537-5	Not Shown
P1		CONNECTOR, PLUG, ELECTRICAL: 26 male contacts, 13 amps, phospher bronze, gold plated finish; rectangular, plastic; 42498 dwg A42559-3; 81312 type MRAC26PG7.	5-25
P2		Same as P1.	5-25
R1		RESISTOR: MIL type RC05GF560J.	5-25
R2		Not used.	
R3		RESISTOR: MIL type RC05GF470K.	5-25
R4		Same as R3.	5-25
R5		RESISTOR: MIL type RC32GF271K.	5-25
XA1		CONNECTOR, RECEPTACLE, ELECTRICAL: 22 female contacts, 5 amps, phospher bronze, gold plated finish; rectangular, plastic; 42498 dwg A42548-8; 81312 type HB22SOC NO KEY.	5-25
XA2 thru XA6		Same as XA1.	5-25
XA7		CONNECTOR, RECEPTACLE, ELECTRICAL: 6 male contacts, 7.5 amps, phospher bronze, gold plated finish; rectangular, plastic; 42498 dwg A42548-1; 81312 type HB6SOC-POLA-B-C.	5-25
Z1		FILTER, MIXER: Nonrepairable assembly, 42498 dwg A44861-1.	5-25

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12 (cont) Z2		X4 MULTIPLIER: Provides a 120 MHz output for the 1.75/-113.75 MHz frequency generator from a 30 MHz input signal generated by the auxiliary frequency generator; 42498 dwg A45000-1.	5-25

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A4		PRINTED CIRCUIT BOARD SUBASSEMBLY, RF1B: 42498 dwg D43071G2.	5-25
C1		CAPACITOR: MIL type CS13BF105K.	5-27
C2		CAPACITOR: MIL type CS13BF156K.	5-27
C3		CAPACITOR, FIXED, GLASS: 1,000 pf, porm 5 pct, 300 vdc; 42498 dwg A42875-2; 14674 type TY07102J.	5-27
C4		Same as C3.	5-27
C5		CAPACITOR: MIL type CK05CW102K.	5-27
C6		Same as C2.	5-27
C7		CAPACITOR: MIL type CK06BX103K.	5-27
C8		CAPACITOR: MIL type CM05E181J03.	5-27
CR1		SEMICONDUCTOR: MIL type 1N483B.	5-27
CR2		SEMICONDUCTOR: MIL type 1N914.	5-27
J1		JACK, TIP: Plastic body; beryllium copper spring contact, gold plated finish; brass terminal; color red; 42498 dwg A42494-1-2; 17117 type 4879-125-2.	5-27
J2		Same as J1.	5-27
Q1		TRANSISTOR: MIL type 2N2222.	5-27
Q2		TRANSISTOR: MIL type 2N2907A.	5-27
Q3		Same as Q1.	5-27
Q4		TRANSISTOR: MIL type 2N930.	5-27
Q5		Same as Q2.	5-27
Q6		TRANSISTOR: Silicon; P-N-P polarity; JEDEC case style VVV (TO-72); 42498 dwg A43044-1; 01295 type 3N111.	5-27
Q7		TRANSISTOR: Silicon; N-P-N polarity; JEDEC case style TO-18; 42498 dwg A43097-1; 07263 type 2N3117.	5-27
Q8		Same as Q2.	5-27
Q9		Same as Q1.	5-27
Q10		Same as Q2.	5-27
Q11		Same as Q7.	5-27
Q12		Same as Q2.	5-27
R1		RESISTOR: MIL type RC05GF102J.	5-27
R2		Same as R1.	5-27
R3		RESISTOR: MIL type RC05GF103J.	5-27
R4		Same as R3.	5-27
R5		RESISTOR: MIL type RC05GF472J.	5-27
R6		RESISTOR: MIL type RC05GF272J.	5-27
R7		Same as R3.	5-27
R8		Same as R5.	5-27
R9		RESISTOR: MIL type RC05GF182J.	5-27
R10		RESISTOR: MIL type RC05GF332J.	5-27
R11		RESISTOR: MIL type RC05GF181J.	5-27
R12		RESISTOR: MIL type RC05GF121J.	5-27
R13		RESISTOR: MIL type RC05GF222J.	5-27
R14		RESISTOR: MIL type RC05GF223J.	5-27
R15		RESISTOR: MIL type RC05GF470J.	5-27
R16		RESISTOR: MIL type RC05GF101J.	5-27
R17		Same as R16.	5-27
R18		Same as R11.	5-27
R19		**RESISTOR: MIL type RC056F680J.**	5-27
R20		Not used.	
R21		RESISTOR: MIL type RC05GF105J.	5-27

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A4 (cont)			
T1		TRANSFORMER, RF: 2 windings; primary winding 7 uh porm 20 pct at 25 deg C at 1 MHz, 50 ohms impedance, 78 ma, 0.06 ohm dc resistance; secondary winding 200 ohms impedance, 39 ma, 0.12 ohm dc resistance; 42498 dwg A42745-4.	5-27
T2		Same as T1.	5-27
T3		TRANSFORMER, RF: 2 windings; primary winding 20 uh at 25 deg C at 1 MHz, 50 ohms impedance; 44 ma, 0.1 ohm dc resistance; secondary winding 200 ohms impedance, 22 ma, 0.2 ohm dc resistance; 42498 dwg A42745-1.	5-27
T4		Same as T3.	5-27
Z1		INTEGRATED CIRCUIT, LOGIC GATE: Dual 4-input buffer; 3.0-4.0v operating voltage; 35 nsec propagation delay; 1.0v noise margin; 25/gate fanout; 25 MW/gate power dissipation; 42498 dwg A44457-5; 14433 type MIC932-3D.	5-27
Z2		INTEGRATED CIRCUIT, LOGIC GATE: Quadruple 2-input gate; 3.0-4.0v operating voltage; 50 nsec propagation delay; 0.6v noise margin; 8/gate fanout; 5 MW/gate power dissipation; 42498 dwg A44457-2; 14433 type MIC946-3D.	5-27
Z3		Same as Z2.	5-27

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A5		PRINTED CIRCUIT BOARD SUBASSEMBLY, RF2: 42498 dwg D43080G2.	5-25
C1		CAPACITOR: MIL type CS13BC396K.	5-28
C2		CAPACITOR: MIL type CS13BE107K.	5-28
C3		CAPACITOR: MIL type CK06BX104K.	5-28
C4		CAPACITOR: MIL type CS13BE156K.	5-28
C5		CAPACITOR, FIXED, GLASS: 10,000 pf, porm 10 pct, 50 vdc; 42498 dwg A42960-1; 14674 type CYK01BT103K.	5-28
C6		Same as C4.	5-28
C7		Same as C4.	5-28
C8		CAPACITOR: MIL type CK05CW102K.	5-28
C9		CAPACITOR: MIL type CK06CW682K.	5-28
C10		CAPACITOR: MIL type CB11RD102K.	5-28
C11		CAPACITOR: MIL type CM05F331J03.	5-28
C12		CAPACITOR: MIL type CM05ED390J03.	5-28
C13		Same as C10.	5-28
C14		CAPACITOR: MIL type CL65CJ050JP3.	5-28
C15		CAPACITOR, VARIABLE, CERAMIC: 3.0-15.0 pf, 200 vdc; 42498 dwg A42545-9; 72982 type 538-016-E2P0-110R.	5-28
C16		Not used.	
C17 thru C20		Same as C8.	5-28
C21		CAPACITOR, VARIABLE, CERAMIC: 9.0-35.0 pf, 200 vdc; 42498 dwg A42545-1; 72982 type 538-016-E2P0-94R.	5-28
C22		CAPACITOR, FIXED, GLASS: 5,100 pf, porm 2 pct, 50 vdc; 42498 dwg A42975-4; 95275 type VY20CA512GE-.	5-28
C23		Same as C22.	5-28
C24		CAPACITOR, FIXED, GLASS: 5,100 pf, porm 2 pct, 50 vdc; 42498 dwg A42975-3; 95275 type VY20CA512GE+.	5-28
C25		Same as C24.	5-28
C26		CAPACITOR: MIL type CK06BX104K.	5-28
CR1		SEMICONDUCTOR: MIL type 1N914.	5-28
CR2		SEMICONDUCTOR: Silicon; JEDEC case style DO-14; 42498 dwg A43737-3; 01281 type PC1251.	5-28
Q1		TRANSISTOR: MIL type 2N2222.	5-28
Q2		Same as Q1.	5-28
Q3		TRANSISTOR: Silicon; N-P-N polarity; JEDEC case style TO-18; 42498 dwg A43097-1; 07263 type 2N3117.	5-28
Q4		TRANSISTOR: MIL type 2N2907A.	5-28
Q5		Same as Q1.	5-28
Q6		TRANSISTOR: Silicon; P-N-P polarity; JEDEC case style VVV (TO-72); 42498 dwg A43044-1; 01295 type 3N111.	5-28
Q7		Same as Q3.	5-28
Q8		Same as Q4.	5-28
Q9		Same as Q1.	5-28
Q10		TRANSISTOR: MIL type 2N930.	5-28
Q11		Same as Q4.	5-28

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A5 (cont)			
Q12		TRANSISTOR: Silicon; P-N-P polarity; JEDEC case style TO-18; 42498 dwg A43085-1; 14433 type TS1847.	5-28
Q13		TRANSISTOR: MIL type 2N918.	5-28
Q14		Same as Q12.	5-28
R1		RESISTOR: MIL type RC05GF470J.	5-28
R2		RESISTOR: MIL type RC05GF332J.	5-28
R3		RESISTOR: MIL type RC05GF563J.	5-28
R4		RESISTOR: MIL type RC05GF103J.	5-28
R5		Same as R4.	5-28
R6		RESISTOR: MIL type RC05GF334J.	5-28
R7		RESISTOR: MIL type RC05GF123J.	5-28
R8		RESISTOR: MIL type RC05GF102J.	5-28
R9		RESISTOR: MIL type RC05GF331J.	5-28
R10		Same as R1.	5-28
R11		RESISTOR: MIL type RC05GF101J.	5-28
R12		Same as R11.	5-28
R13		RESISTOR: MIL type RC05GF224J.	5-28
R14		RESISTOR: MIL type RC05GF104J.	5-28
R15		Same as R4.	5-28
R16		RESISTOR: MIL type RC05GF682J.	5-28
R17		RESISTOR: MIL type RC05GF273J.	5-28
R18		Same as R3.	5-28
R19		Same as R16.	5-28
R20		RESISTOR: MIL type RC05GF272J.	5-28
R21		Same as R11.	5-28
R22		Same as R3.	5-28
R23		RESISTOR: MIL type RC05GF391J.	5-28
R24		Same as R4.	5-28
R25		Same as R7.	5-28
R26		RESISTOR: MIL type RC05GF820J.	5-28
R27		Same as R1.	5-28
R28		Same as R1.	5-28
R29		Same as R4.	5-28
R30		RESISTOR: MIL type RC05GF392J.	5-28
R31		RESISTOR: MIL type RC05GF271J.	5-28
R32		Same as R11.	5-28
R33		Same as R7.	5-28
R34		Same as R4.	5-28
R35		Same as R9.	5-28
R36		Not used.	
R37		RESISTOR: MIL type RN55E2612F	5-28
R38 thru R40		Same as R37.	5-28
T1		TRANSFORMER, RF: 2 windings; primary winding 7 uh porm 20 pct at 25 deg C at 1 MHz, 50 ohms impedance, 78 ma, 0.06 ohm dc resistance; secondary winding 200 ohms impedance, 39 ma, 0.12 ohm dc resistance; 42498 dwg A42745-4.	5-28
T2		Same as T1.	5-28
T3		TRANSFORMER, RF: 2 windings; primary winding 0.09 uh, 100 MHz, min self resonant frequency, 20 ma, 0.2 ohm dc resistance; secondary winding 0.7 ohm dc resistance; 42498 dwg A42748-3.	5-28

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A7A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, DIGITAL NO. 1A: 42498 dwg D42566G2.	5-30
C1		CAPACITOR: MIL type CS13BC396K.	5-31
CR1		Not used.	
CR2		Not used.	
CR3		SEMICONDUCTOR: MIL type 1N914.	5-31
CR4		Same as CR3.	5-31
L1		COIL, RF: MIL type MS75008-32.	5-31
Z1		INTEGRATED CIRCUIT, LOGIC GATE: Triple 3 input NAND/NOR gate; 3.0-4.0v operating voltage; 1.0v noise margin; 8/gate fanout; 5 MW/gate power dissipation; 42498 dwg A44457-3; 14433 type MIC962-3D.	5-31
Z2		INTEGRATED CIRCUIT, LOGIC GATE: Dual 4-input buffer; 3.0-4.0v operating voltage; 35 nsec propagation delay; 1.0v noise margin; 25/gate fanout; 25 MW/gate power dissipation; 42498 dwg A44457-5; 14433 type MIC932-3D.	5-31
Z3		INTEGRATED CIRCUIT, FLIP FLOP: High speed flip flop; plus 8.0v continuous supply voltage, plus 12v pulsed supply voltage, minus 10 ma forward input current, 5.0 ma reverse input current, minus 1.0v or plus 8.0v input voltage; 42498 dwg A47728-1; 14433 type MIC950-3D.	5-31
Z4 thru Z7		Same as Z3.	5-31

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A12A7A2		PRINTED CIRCUIT BOARD SUBASSEMBLY, DIGITAL NO. 1B: 42498 dwg D45887G1.	5-30
C1		CAPACITOR: MIL type CS13BC396K.	5-32
CR1		SEMICONDUCTOR: MIL type 1N914.	5-32
CR2 thru CR5		Same as CR1.	5-32
Z1		INTEGRATED CIRCUIT, FLIP FLOP: High speed flip flop; plus 8.0v continuous supply voltage, plus 12v pulsed supply voltage, minus 10 ma forward input current, 5.0 ma reverse input current, minus 1.0v or plus 8.0v input voltage; 42498 dwg A47728-1; 14433 type MIC950-3D.	5-32
Z2 thru Z11		Same as Z1.	5-32

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A16A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, OUTPUT AMPLIFIER NO. 1: 42498 dwg D44411G1.	5-45
C1		CAPACITOR: MIL type CK06CW103K.	5-46
C2		Same as C1.	5-46
C3		Same as C1.	5-46
C4		CAPACITOR: MIL type CL65BH151MP3.	5-46
C5 thru C8		Same as C1.	5-46
C9		Same as C4	5-46
C10		CAPACITOR: MIL type CM05FC100J03.	5-46
C11		Same as C1.	5-46
C12		CAPACITOR: MIL type CM05FC101J03.	5-46
C13		CAPACITOR: MIL type CM05FC470J03.	5-46
C14		Same as C1.	5-46
CR1		SEMICONDUCTOR: MIL type 1N914.	5-46
CR2		Same as CR1.	5-46
FL1		FILTER ASSEMBLY: Non-repairable assembly; 35 MHz; 42498 dwg A46516-1.	5-46
K1		RELAY: MIL type M5757/9-003.	5-46
L1		COIL, RF: MIL type MS90537-1.	5-46
L2		COIL, RF: MIL type MS90537-41.	5-46
L3		COIL, RF: MIL type MS90537-50.	5-46
L4		COIL, RF: MIL type MS90537-5.	5-46
L5		COIL, RF: MIL type MS90537-43.	5-46
P1		CONNECTOR: MIL type UG1460U.	5-46
Q1		TRANSISTOR: MIL type 2N918.	5-46
R1		RESISTOR: MIL type RC07GF510K.	5-46
R2		RESISTOR: MIL type RC07GF123K.	5-46
R3		RESISTOR: MIL type RC07GF822K.	5-46
R4		RESISTOR: MIL type RC07GF181K.	5-46
R5		RESISTOR: MIL type RC07GF150K.	5-46
R6		RESISTOR: MIL type RC07GF471K.	5-46
R7		RESISTOR: MIL type RC07GF2R7K.	5-46
R8		Same as R6.	5-46
R9		Same as R7.	5-46
R10		Same as R6.	5-46
R11		Same as R6.	5-46
R12		Same as R1.	5-46
R13		Same as R1.	5-46
R14		RESISTOR: MIL type RC07GF103K.	5-46
R15		RESISTOR: MIL type RC07GF102K.	5-46
R16		RESISTOR: MIL type RC07GF561K.	5-46
R17		Same as R1.	5-46
T1		TRANSFORMER, RF: 2 windings; primary winding 9.2 uh porm 20 pct at 25 deg C, 50 ohms impedance, 0 ma, 0.08 ohm dc resistance; secondary winding 50 ohms impedance, 0 ma, 0.08 ohm dc resistance; 42498 dwg A45387-2.	5-46

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A16A2		PRINTED CIRCUIT BOARD SUBASSEMBLY, OUTPUT AMPLIFIER NO. 2: 42498 dwg D44179G1.	5-45
C1		CAPACITOR: MIL type CK06CW103K.	5-47
C2 thru C5		Same as C1.	5-47
C6		CAPACITOR: MIL type CS13BF226K.	5-47
C7 thru C10		Same as C1	5-47
C11		Capacitor: MIL type CK06BX103K	5-47
C12		Same as C11	5-47
C13 thru C21		Same as C1	5-47
L1		COIL, RF: MIL type MS90537-41.	5-47
L2		COIL, RF: MIL type MS90537-31.	5-47
L3		Same as L2.	5-47
L4		COIL, RF: MIL type MS90537-29.	5-47
L5 & L6		Same as L1.	5-47
L7		COIL, RF: MIL type MS90537-35.	5-47
L8		Same as L7.	5-47
Q1		TRANSISTOR: MIL type 2N2219.	5-47
Q2 thru Q7		Same as Q1.	5-47
Q8		TRANSISTOR: Silicon, N-P-N polarity; 0.375 in dia by 0.558 in lg excl terminals; 42498 dwg A43995-3; 13923 type S-1001.	5-47
Q9		Same as Q8.	5-47
R1		RESISTOR: MIL type RC07GF182K.	5-47
R2		RESISTOR: MIL type RC07GF681K.	5-47
R3		RESISTOR: MIL type RC07GF181K.	5-47
R4		Same as R3.	5-47
R5		RESISTOR: MIL type RC07GF470K.	5-47
R6		RESISTOR: MIL type RC07GF152K.	5-47
R7		RESISTOR: MIL type RC07GF122K.	5-47
R8		RESISTOR: MIL type RC07GF180K.	5-47
R9		RESISTOR: MIL type RC07GF331K.	5-47
R10		Same as R9.	5-47
R11		Same as R8.	5-47
R12		RESISTOR: MIL type RC07GF222K.	5-47
R13		Same as R9.	5-47
R14		RESISTOR: MIL type RC07GF391K.	5-47
R15		RESISTOR: MIL type RC42GF181K.	5-47
R16		Same as R15.	5-47
R17		Same as R1.	5-47
R18 & R19		Same as R7.	5-47
R20		Same as R1.	5-47
R21		RESISTOR: MIL type RC20GF820K.	5-47
R22		Same as R21.	5-47
R23 & R24		Same as R8.	5-47
R25		RESISTOR: MIL type RC07GF151K.	5-47
T1		TRANSFORMER, RF: 2 windings; primary winding 47 uh porm 20 pct at 25 deg C, 200 ohms impedance, 0 ma unbalanced dc, 200 ma balanced dc, 0.04 ohm dc resistance; secondary winding 200 ohms impedance, 0 ma, 0.04 ohm dc resistance; 42498 dwg A45388-2.	5-47

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A17 (cont)			
R31		Same as R10.	5-48
R32		Same as R19.	5-48
R33		Same as R19.	5-48
R34		RESISTOR: MIL type RW69V820.	5-48
R35		Same as R19.	5-48
R36		Same as R34.	5-48
R37		Same as R19.	5-48

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18		MODULATOR-SYNTHESIZER ASSEMBLY: The main chassis consists of two decks hinged at the rear where all modules, filters, and transformers are mounted for the operation of the exciter; all interconnecting cables are mounted between the decks and two multi-pin connectors are mounted on the rear panel for interface with the filter assembly; the majority of the operating controls, indicators, meters, and frequency setting switches are mounted on the front panel assembly; a sub-panel mounted behind the front panel contains auxiliary controls used for test and maintenance purposes; the front panel is connected to the chassis with a cable sufficiently long to permit the front panel to be removed for maintenance purposes; 42498 dwg E44203G1.	5-2
AT1		ATTENUATOR, VARIABLE: 50 ohms, porm 10 pct, 5w; 42498 dwg A44194-1; 01121 type JJ50OHMSPORM10PCT	5-55
AT2 thru AT4		Same as AT1.	5-55
C1		CAPACITOR: MIL type CK05CW102K.	5-55
C2		CAPACITOR: MIL type CK05CW221K.	5-55
C3		Same as C1.	5-55
C4		CAPACITOR: MIL type CK05BX102K. (Not shown)	
C5		Not used.	
C6		CAPACITOR: MIL type CK05BX102K.	
C7		CAPACITOR: MIL type CM05ED390J03	Not Shown
C8		CAPACITOR: MIL type CK05BK103K	Not Shown
CB1		CIRCUIT BREAKER: SPDT; 1.0 amp, 240 vac, 60 kHz; 42498 dwg A44733-1; 81541 type AP13-SR199-1.	5-55
CR1		ABSORBER, OVERVOLTAGE: 33 vdc operating voltage, 1 vdc max reverse voltage; 42498 dwg A46062-1; 81840 type 126911-001.	5-55
CR2		SEMICONDUCTOR: MIL type IN483B.	5-55
CR3		Same as CR1.	5-55
CR4 & CR5		Same as CR2.	5-55
CR6		Not used.	
CR7		Not used.	
CR8		SEMICONDUCTOR: MIL type 1N1614R.	5-55
CR9		Same as CR8.	5-55
CR10		Not used.	
DS1		LAMP, INCANDESCENT: 18 vdc, 0.04 amp; T-1-3/4 bulb; 42498 dwg A46155-2; 92966 type 370.	5-55
DS2		Same as DS1.	5-55
DS3		Same as DS1.	5-55
DS4		Same as DS1.	5-55
DS5		Same as DS1.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
DS6		LAMP: MIL type MS25237-327	5-55
DS7		Same as DS6.	5-55
DS8		Same as DS1.	5-55
DS9		Same as DS1.	5-55
J1		CONNECTOR, RECEPTACLE, ELECTRICAL: 1 female contact bronze; 1 amp, 50 ohms impedance, 50 vdc; phosphor brass body, silver plated finish, straight shape; 42498 dwg A44259-1; 74868 type 17825.	5-55
J2 & J3		Same as J1.	5-55
A18 (cont)		JACK, TELEPHONE: MIL type JJ024.	5-55
J8		CONNECTOR: MIL type MS18185-1.	5-55
J9		CONNECTOR: MIL type MS18184-1. (Not shown)	5-55
M1		METER, ELECTRICAL FREQUENCY: Minus 20 to plus 3 VU range of inscription; porm 0.5 pct accuracy at full scale deflection; white background w/black and red markings; 42498 dwg A44022-1.	5-55
M2		AMMETER: 0 to 100 ua range of inscription; prom 3 pct accuracy at full scale deflection; white background w/black and green markings; 42498 dwg A44050-1.	5-55
MP1		KNOB: MIL type MS91528-1E1B.	5-55
MP2		KNOB: MIL type MS91528-1E2B.	5-55
MP3 thru MP5		Same as MP2.	5-55
MP6		KNOB: MIL type MS91528-1K2B.	5-55
MP7 thru MP10		Same as MP6.	5-55
MP11		KNOB: MIL type MS91528-1D2B.	5-55
MP12 thru MP16		Same as MP11.	5-55
MP17		DIAL, CONTROL: Round plastic; 0 to 9 CCW range of inscription; setscrew mtd; 42498 dwg B44389G1.	5-55
MP18 thru MP22		Same as MP17.	5-55
MP23		DIAL, CONTROL: Round aluminum; 0 to minus 30, plus 10 and plus 5 CCW range of inscription; setscrew mtd; 42498 dwg C44553G1.	5-55
MP24 thru MP26		Same as MP23.	5-55
MP27		DIAL, COUNTING: Round, clear finish; 0 to 30 turns w/mechanical brake; 100 dial divisions per turn; white markings with black background; 42498 dwg A46059-1; 80294 type H492-3.	5-55
MP28		Slide Assy, R.H.: aluminum channels and lock arms, aluminum anodized finish, cadmium plated cres components; 42498 dwg D44599-8.	5-51
M29		Slide Assy, L.H.: aluminum channels and lock arms, aluminum anodized finish; cadmium plated cres components; 42498 dwg D44599-7.	5-51
P1		CONNECTOR, PLUG, ELECTRICAL: 1 male contact; plastic insulation right angle shape; 42498 dwg A47741-1; 98291 type 51-011-7848.	5-55
P2 thru P8		Same as P1.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG NO.
P9		CONNECTOR, PLUG, ELECTRICAL: 1 male contact; plastic insulation; straight shape; 42498 dwg A46060-1; 94375 type 801-B-1800W.	5-55
P10		Same as P9.	5-55
P11		Same as P9.	5-55
P12		CONNECTOR: MIL type UG1460U.	5-55
P13		Same as P12.	5-55
Q1		TRANSISTOR: Silicon; P-N-P polarity; JEDEC case style TO-3; 42498 dwg A43788-1; 04713 type 2N3789.	5-55
Q2		Same as Q1.	
R1		RESISTOR: MIL type RN60D2151F.	5-55
R2		Same as R1.	5-55
R3		RESISTOR, VARIABLE: 500 ohms, porm 10 pct, lw; 42498 dwg A45111-1; 01121 type JAIN056S501DA.	5-55
R4		Same as R1.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18 (cont)			
R5		Same as R1.	5-55
R6		Same as R3.	5-55
R7		Same as R1.	5-55
R8		Same as R1.	5-55
R9		Same as R3.	5-55
R10		Same as R1.	5-55
R11		Same as R1.	5-55
R12		Same as R3.	5-55
R13		RESISTOR: MIL type RV6LAYSA503A.	5-55
R14		RESISTOR: MIL type RN70D49R9B.	5-55
R15 thru R21		Same as R14.	5-55
R22		RESISTOR: MIL type RC07GF205J.	5-55
R23		RESISTOR: MIL type RN60D4223F.	5-55
R24		RESISTOR: MIL type RN60D2433F.	5-55
R25		RESISTOR: MIL type RN60D8252F.	5-55
R26		RESISTOR: MIL type RN60D2552F.	5-55
R27		RESISTOR: MIL type RN60D2153F.	5-55
R28		RESISTOR: MIL type RN60D6342F.	5-55
R29		RESISTOR: MIL type RN60D2211F.	5-55
R30		RESISTOR: MIL type RN60D8060F.	5-55
R31		RESISTOR: MIL type RN60D4991F.	5-55
R32		RESISTOR: MIL type RN60D1001F.	5-55
R33		RESISTOR: MIL type RV6NAYSD504C.	5-55
R34		RESISTOR: MIL type RV4LAYSA353A.	5-55
R35		RESISTOR, VARIABLE: 20 ohms porm 0.2 pct linearity; 0 to 30 turns; 42498 dwg A46058-1; 80294 type 3500S-2-203.	5-55
R36		RESISTOR: MIL type RN60D1820F.	5-55
R37 thru R43		Same as R36.	5-55
R44		Not used.	
R45		RESISTOR: MIL type RC07GF154J.	5-55
R46		Not used.	
R47		RESISTOR: MIL type RC07GF4R7J.	5-55
R48 thru R50		Same as R47.	5-55
R51		Not used.	
R52		RESISTOR: MIL type RC07GF100K.	5-55
R53		Same as R52.	5-55
R54		Same as R52.	5-55
R55		RESISTOR: MIL type RC07GF153K. (Not shown)	
S1		SWITCH, ROTARY: 1 section, 2 poles and 5 positions; nonshorting contacts; 36 deg positioning increment; 42498 dwg A44379-1; 76854 type 267625-BA1.	5-55
S2		SWITCH, ROTARY: Solenoid actuated; 28 vdc, 8.02 ohms coil resistance, 15 to 25 steps per second solenoid CW speed; contact rating 2 amps at 28 vdc resistive and 1 amp at 110 vac resistive; 3 sections, 6 positions each section; 42498 dwg A45452-1; 81840 type 172495-001.	5-55
S3		SWITCH, ROTARY: Solenoid actuated; 28 vdc, 8.02 ohms coil resistance, 15 to 25 steps per second solenoid CW speed; contact rating 2 amps at 28 vdc resistive and 1 amp at 110 vac resistive; 4 sections with 7 positions for each section; 30 deg positioning increment; 42498 dwg A45453-1; 81840 type 172494-001.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18 (cont)			
S4		SWITCH, ROTARY: 3 sections; 1 pole on section one, 24 dummy lugs on section two, 1 pole on section three with 24 positions for each section; non-shorting contacts; 15 deg positioning increment; 42498 dwg A44377-1; 76854 type 267623-MF3E.	5-55
S5		SWITCH, ROTARY: One section; 4 poles with 3 positions, non-shorting contacts, 36 deg positioning increment; 42498 dwg A44615-1; 76854 type 267629-BA1.	5-55
S6		SWITCH, ROTARY: 3 sections; 2 poles on sections one and two, 1 pole on section three with 10 positions for each section; non-shorting contacts; 36 deg positioning increment; 42498 dwg A44610-1; 76854 type 267628-BA3.	5-55
S7		SWITCH, ROTARY: 2 sections; 2 poles on section one, 1 pole on section two with 10 positions for each section; non-shorting contacts; 36 deg positioning increment; 42498 dwg A44592-1; 76854 type 267626-BA2.	5-55
S8		SWITCH, ROTARY: 3 sections; 2 poles on sections one and two, 1 pole on section three with 10 positions for each section; non-shorting contacts; 36 deg positioning increment; 42498 dwg A44601-1; 76854 type 267627-BA3.	5-55
S9		Same as S7.	5-55
S10		Same as S7.	5-55
S11		SWITCH, ROTARY: 5 sections; 8 poles and 2 positions for each section; non-shorting contacts; 36 deg positioning increment; 42498 dwg A44378-1; 76854 type 267624-MF6E.	5-55
S12		Not used.	
S13		SWITCH: MIL type MS75029-23.	5-55
S14		Same as S13.	5-55
S15		SWITCH, PUSH: 2PDT; 3 amps at 28 vdc resistive and 1.5 amps at 28 vdc inductive; 42498 dwg A44044-28; 96182 type 90E10A1C2J1(W)H1L10N1R12 TUNE.	5-55
S15DS1		LAMP, INCANDESCENT: 18 vdc, 0.04 amp; T-1 3/4 bulb; 42498 dwg A46155-2; 92966 type 370.	5-55
S15DS2		Same as S15DS1.	5-55
S16		SWITCH, PUSH: 2PDT; 3 amps at 28 vdc resistive and 1.5 amps at 28 vdc inductive; 42498 dwg A44044-27; 96182 type 90E10A1C2J1(W)H1L10N1R12 STANDBY.	5-55
S16DS1		Same as S15DS1.	5-55
S16DS2		Same as S15DS1.	5-55
S17		SWITCH, PUSH: 2PDT; 3 amps at 28 vdc resistive and 1.5 amps at 28 vdc inductive; 42498 dwg A44044-26; 96182 type 90E10A1C2J1(G)H1L10N1R12 OPERATE.	5-55
S17DS1		Same as S15DS1.	5-55
S17DS2		Same as S15DS1.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18 (cont)			
S18		SWITCH, PUSH: 2PDT; 3 amps at 28 vdc resistive and 1.5 amps at 28 vdc inductive; 42498 dwg A44044-29; 96182 type 90E10A1C2J1(W)H1L10N1R13 AMPLIFIER, OFF.	5-55
S18DS1		Same as S15DS1.	5-55
S18DS2		Same as S15DS1.	5-55
S19		SWITCH: MIL type MS75029-27.	5-55
T1		TRANSFORMER, AF: Minus 250 to 6000 cps operating frequency range, minus 600 ohms primary impedance; no dc current in windings; 42498 dwg A43633-1.	5-55
T2 thru T4		Same as T1.	5-55
XA1		CONNECTOR: MIL type MS18177-1.	5-55
XA2 thru XA4		Same as XA1.	5-55
XA5		CONNECTOR: MIL type M21097/1-145.	5-55
XA6		Not used.	
XA7 thru XA9		Same as XA1.	5-55
XA10		Not used.	
XA11		CONNECTOR, RECEPTACLE, ELECTRICAL: 26 female contacts, 13 amps, phospher bronze, gold plated finish; rectangular shape, plastic; 42498 dwg A42560-1; 81312 type MRAC26SG7.	5-55
XA12P1		Same as XA11.	5-55
XA12P2		Same as XA11.	5-55
XA13 thru XA16		Same as XA1.	5-55
XDS1		LIGHT: MIL type LH73/1LC12CN2.	5-55
XDS2		Same as XDS1.	5-55
XDS3		Same as XDS1.	5-55
XDS4		LIGHT, INDICATOR: 1 amp; accommodates two incandescent T-1 3/4 midget flange base lamps; marked "Ready"; filter color green; 42498 dwg A44045-21; 96182 type 80E10A1F1(G)H1J1L1N12 READY.	5-55
XDS5		Not used.	
XDS6		LIGHT, INDICATOR: 1 amp; accommodates two incandescent T-1 3/4 midget flange base lamps; marked "STD OVEN/STD FAIL"; filter color amber; 42498 dwg A44045-20; 96182 type 80E10A1F2(YR) H2J2L1N16 STD OVEN/STD FAIL.	5-55
XDS7		Not used.	
XDS8		LIGHT, INDICATOR: 1 amp; accommodates two incandescent T-1 3/4 midget flange base lamps; marked "EXC FAIL/XMTR FAIL"; filter color red/red; 42498 dwg A44045-23; 96182 type 80E10A1F2(RR) H2J2L1N16 EXC FAIL/XMTR FAIL.	5-55
XPS1		CONNECTOR: MIL type MS18177-1.	5-55
Z1		X4 MULTIPLIER: Provides a 120 MHz output for the 1.75/-113.75 MHz frequency generator from a 30 MHz input signal generated by the auxiliary frequency generator; 42498 dwg A45000-1.	5-55

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18A2 (cont)			
R6		Same as R5.	5-57
R7		Same as R5.	5-57
R8		RESISTOR: MIL type RC07GF272K.	5-57
R9		RESISTOR: MIL type RC07GF221J.	5-57
R10		RESISTOR: MIL type RC07GF271J.	5-57
R11		Same as R9.	5-57
R12		Same as R10.	5-57
R13		Same as R9.	5-57
R14		Same as R10.	5-57
R15		RESISTOR: MIL type RC07GF333J.	5-57
R16		Same as R15.	5-57
R17		Same as R15.	5-57
R18		RESISTOR: MIL type RC32GF221K.	5-57
R19		RESISTOR: MIL type RC07GF334K.	5-57
R20		RESISTOR: MIL type RC07GF104K.	5-57
R21		RESISTOR: MIL type RC07GF391K.	5-57
R22		RESISTOR: MIL type RC07GF103K.	5-57
R23		RESISTOR: MIL type RC07GF393J.	5-57
R24		RESISTOR: MIL type RC07GF101K.	5-57
R25		RESISTOR: MIL type RC07GF103J.	5-57
R26		RESISTOR: MIL type RC07GF681J.	5-57
R27		RESISTOR: MIL type RC07GF182J.	5-57
R28		RESISTOR: MIL type RC07GF471J.	5-57
R29		Same as R20.	5-57
R30		Same as R22.	5-57
R31		RESISTOR: MIL type RC07GF102K.	5-57
R32		Not used.	
R33		Not used.	
R34		RESISTOR: MIL type RC07GF302K.	5-57
R35 thru R37		Not used.	
R38		RESISTOR: MIL type RC07GF622K.	5-57
R39		Same as R38.	5-57
R40		RESISTOR: MIL type RC07GF471K.	5-57
R41 thru R43		Same as R40.	5-57
R44		RESISTOR: MIL type RC42GF183K.	5-57
R45		RESISTOR: MIL type RC07GF123K.	5-57
R46		RESISTOR: MIL type RC07GF182K.	5-57
R47		RESISTOR: MIL type RC07GF271K.	5-57
Z1		INTEGRATED CIRCUIT, LOGIC GATE: High speed differential comparator; plus 14v positive supply voltage, minus 7v negative supply voltage, 10 ma, 300 MV internal power dissipation; 42498 dwg A42423-10; 14433 type **U5B7710-31X**	5-57
Z2 to Z4		Same as Z1.	5-57

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18A3		FREQUENCY SELECT BOARD SUBASSEMBLY: Located in close proximity to the Synthesizer Assembly, is a diode-biasing network for the frequency selection circuitry and a diode-gate circuit for control of the up-converter assembly during frequency selection; 42498 dwg C44958G1.	5-55
CR1		SEMICONDUCTOR: MIL type 1N914.	5-58
CR2		Same as CR1.	5-58
R1		RESISTOR: MIL type RC07GF332J.	5-58
R2 thru R22		Same as R1.	5-58

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A18A6		POWER DISTRIBUTION BOARD SUBASSEMBLY: 42498 dwg D46591G1.	5-55
C1		CAPACITOR: MIL type CS13BF476M. (Not shown)	
C2		CAPACITOR: MIL type CK05BX102K. (Not shown)	
K1		RELAY: MIL type M5757/9-003.	5-61
K2 thru K5		Same as K1.	5-61
R1		Not used.	
R2		RESISTOR: MIL type RJ24CW105.	5-61
R3		RESISTOR: MIL type RJ24CW503.	5-61
R4		RESISTOR: MIL type RJ24CW104.	5-61
R5		RESISTOR: MIL type RC42GF101K.	5-61
R6		Same as R4.	5-61
R7		RESISTOR: MIL type RJ24CW253.	5-61

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
A19		FILTER PANEL ASSEMBLY, MODULATOR-SYNTHESIZER: Comprised of RFI filters and interconnecting cables used for signal and input power connections; interfacing with the external RF amplifier and auxiliary equipment; they are mounted on the rear panel which in turn is fastened to the outer case with machine screws through the RFI gasket; 42498 dwg E44634G1.	5-1
C1		CAPACITOR: MIL type CK06CW103K.	5-4
C2		Same as C1.	5-4
E1		TERMINAL: MIL type SE199D01.	5-4
E2		Same as E1.	5-4
FL1		FILTER, RADIO INTERFERENCE: 250 vac or minus 600 vdc; 2 x 1.5 amps, 47 to 63 cps at rated voltage; 42498 dwg **A44196-1; 13619 type RF 2890-3**	**5-4**
FL2		FILTER, RADIO INTERFERENCE: 24 sections; 100 vdc for all sections, 0.10 amp at 25 deg C for all **sections; 42498 dwg A44834-1; 13619 type RF 3059**	**5-4**
FL3		FILTER, RADIO INTERFERENCE: 19 sections; 100 vdc for all sections, 0.1 amp at 25 deg C for 11 sections; 42498 dwg A44842-1.	5-3
J1		CONNECTOR, RECEPTACLE, ELECTRICAL: 1 female contact, 50 ohms impedance, straight shape; 42498 dwg A43520-1; 94375 type 011-N3805-85.	5-3
J2		CONNECTOR: MIL type MS35182-911A.	5-3
J3		Same as J2.	5-3
J4		CONNECTOR, RECEPTACLE, ELECTRICAL: 1 female contact, 50 ohms impedance, 1 amp, 500 vdc, phospher bronze; straight shape, brass, silver plated finish; 42498 dwg A44259-1; 74868 type 17825.	5-3
J5		Same as J4.	5-3
J6		CONNECTOR: MIL type MS3114E12-10P.	5-3
J7		CONNECTOR: MIL type MS3114E20-39P.	5-3
J8		CONNECTOR: MIL type MS3114E20-39PW.	5-3
L1		INDUCTOR: MIL type MS90537-25.	5-4
L2		Same as L1.	5-4
P1		CONNECTOR: MIL type MS18185-1.	5-4
P2		CONNECTOR: MIL type MS18184-1.	5-4
A20		**SIDE CARRIER GENERATOR SIMULATOR: Satisfies all logic requirements for the fault system of the exciter that are normally produced by the Side Carrier Generator (A9). FSN IN5820-168-8332**	**4-12A**
R1		**RESISTOR: MIL type RF42GF361T**	**4-12A**
P1		**CONNECTOR: MIL type MS18176-1**	**4-12A**

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1		POWER SUPPLY ASSEMBLY: The power supply used by the exciter contains four individual voltage regulating circuits fed from a common power transformer and full-wave rectifier circuit; the regulator circuits consist of a minus 18 volt regulator; plus 5 and plus 18 volt regulator; plus 15 and plus 24 volt regulator; plus 125 watt regulator and a switching regulator; the 12.5 MHz pulse supplied by the synthesizer synchronizes the plus 5 and plus 18 volt solid-state switching circuits; 42498 dwg E44109G1.	5-1
C1		CAPACITOR: MIL type CE71C182H.	5-49
CR1		SEMICONDUCTOR: MIL type 1N1124A.	5-49
CR2 thru CR6		Same as CR1.	5-49
CR7		SEMICONDUCTOR: MIL type 1N4942.	5-49
J1		CONNECTOR: MIL type MS18177-1.	5-49
L1		REACTOR: 6 mh porm 15 pct at 0.1v RMS; 1 kHz and 0 amp dc, incremental inductance 3.2 mh min at 1 kHz and 4 amps dc, Q 150 min at 1 kHz and 0.1v RMS, 0.25 ohm dc resistance, 55v peak operating voltage; 42498 dwg A45393-1.	5-49
P1		CONNECTOR: MIL type MS18176-1.	5-49
Q1 thru Q5		Not used	
Q6		TRANSISTOR: MIL type 2N3789.	5-49
R1		RESISTOR: MIL type RE60GR250.	5-49
S1		SWITCH: MIL type MS35059-23.	5-49
T1		TRANSFORMER, POWER, STEP-UP: Primary winding 115 and 230v RMS, 47 to 63 cps, single phase; secondary winding no. one 72v RMS center tapped, 2.5 amps dc continuous duty; secondary winding no. two 34 v RMS, 4.0 amps dc porm 10 pct duty cycle; secondary winding no. three 70v RMS, 0.04 amp dc continuous duty; 42498 dwg A44703-1.	5-49

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, -12V REGULATOR: 42498 dwg D43999G1.	5-49
C1		CAPACITOR: MIL type CL65BH151MP3.	5-51
C2		Same as C1.	5-51
C3		CAPACITOR: MIL type CS13BF105K.	5-51
CR1		Not used.	
CR2		SEMICONDUCTOR: MIL type 1N914.	5-51
CR3		Same as CR2.	5-51
CR4		Same as CR2.	5-51
CR5		SEMICONDUCTOR: MIL type 1N821.	5-51
Q1		TRANSISTOR: MIL type 2N2907.	5-51
Q2		Same as Q1.	5-51
Q3		TRANSISTOR: MIL type 2N2222.	5-51
R1		Not used.	
R2		Not used.	
R3		RESISTOR: MIL type RC07GF272K.	5-51
R4		RESISTOR: MIL type RW69VR82.	5-51
R5		RESISTOR: MIL type RC07GF151K.	5-51
R6		RESISTOR: MIL type RC07GF332J.	5-51
R7		RESISTOR: MIL type RC07GF562J.	5-51

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2		POWER SUPPLY REGULATOR ASSEMBLY: 42498 dwg A48372G1.	5-49
P1		CONNECTOR: MIL type MS18176-1.	5-50A

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2MP1		BRACKET SUBASSEMBLY: 42498 dwg C48373G1.	5-50A
CR1 thru CR7		Not used.	
CR8		SEMICONDUCTOR: MIL type 1N2974B.	5-50B
Q1		TRANSISTOR: MIL type 2N1490.	5-50B
Q2		TRANSISTOR: MIL type 2N2219.	5-50B
Q3		TRANSISTOR: MIL type 2N1485.	5-50B
Q4		TRANSISTOR: Silicon; P-N-P polarity; JEDEC case style TO-3; 42498 dwg A43788-1; 04713 type 2N3789.	5-50B
Q5		Same as Q4.	5-50B
Q6		Not used.	
Q7		Same as Q4.	5-50B
R1		Not used.	
R2		RESISTOR: MIL type RE60G5R11.	5-50B

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2A1		PRINTED CIRCUIT BOARD SUBASSEMBLY, +5 AND +18 VOLT REGULATOR: 42498 dwg D42577G2.	5-50A
C1		CAPACITOR: MIL type CS13BF476K.	5-52
C2		CAPACITOR: MIL type CS13BE155K.	5-52
C3		CAPACITOR: MIL type CK05CW102K.	5-52
C4		CAPACITOR: MIL type CK06BX223K.	5-52
C5		CAPACITOR: MIL type CK06CW103K.	5-52
C6		Same as C2.	5-52
C7		Same as C5.	5-52
C8		CAPACITOR: MIL type CL65BH151MP3.	5-52
C9		Same as C8.	5-52
C10		Not used.	
C11		Same as C5.	5-52
C12		Same as C5.	5-52
C13		Same as C3.	5-52
C14		Same as C5.	5-52
C15		Same as C8.	5-52
C16		Same as C8.	5-52
CR1		SEMICONDUCTOR: MIL type 1N967B.	5-52
CR2		SEMICONDUCTOR: MIL type 1N821.	5-52
CR3		SEMICONDUCTOR: MIL type 1N754A.	5-52
CR4		SEMICONDUCTOR: MIL type 1N4942.	5-52
CR5		Same as CR3.	5-52
CR6		Same as CR4.	5-52
L1		REACTOR: 7 mh at porm 10 pct at 1v RMS; 1.0 amp dc, Q 80 min at 1 kHz and 1v RMS, 0.38 ohm dc resistance; 42498 dwg A43531-1.	5-52
L2		Same as L1.	5-52
Q1		TRANSISTOR: MIL type 2N2222.	5-52
Q2		Same as Q1.	5-52
Q3		TRANSISTOR: MIL type 2N2907A.	5-52
Q4		Same as Q1.	5-52
Q5		Same as Q1.	5-52
Q6		Same as Q3.	5-52
R1		RESISTOR: MIL type RW70U2210F.	5-52
R2		RESISTOR: MIL type RC07GF272K.	5-52
R3		RESISTOR: MIL type RC07GF123K.	5-52
R4		RESISTOR: MIL type RC07GF102K.	5-52
R5		RESISTOR: MIL type RC07GF222K.	5-52
R6		RESISTOR: MIL type RN55C1211F.	5-52
R7		RESISTOR: MIL type RN55C5621F.	5-52
R8		RESISTOR: MIL type RC42GF471K.	5-52
R9		Same as R4.	5-52
R10		RESISTOR: MIL type RC07GF101K.	5-52
R11		Same as R4.	5-52
R12		RESISTOR: MIL type RC07GF330K.	5-52
R13		RESISTOR: MIL type RC07GF100K.	5-52
R14		RESISTOR: MIL type RC07GF392K.	5-52
R15		RESISTOR: MIL type RC07GF331K.	5-52
R16		RESISTOR: MIL type RC07GF223K.	5-52
R17		Same as R7.	5-52
R18		RESISTOR: MIL type RN55C2211F.	5-52
R19		Same as R2.	5-52

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2A1 (cont)			
R20		Same as R13.	5-52
R21		Same as R3.	5-52
R22		Same as R4.	5-52
R23		Same as R8.	5-52
R24		Same as R4.	5-52
R25		Same as R10.	5-52
R26		Same as R12.	5-52
R27		Same as R14.	5-52
R28		Same as R4.	5-52
R29		Same as R16.	5-52
Z1		INTEGRATED CIRCUIT, LOGIC GATE: High speed differential comparator; plus 14v positive supply voltage, minus 7v negative supply voltage, 10 ma, 300 MW internal power dissipation; 42498 dwg A42423-10; 14433 type UA710.	5-52
Z2		Same as Z1.	5-52

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2A2		PRINTED CIRCUIT BOARD SUBASSEMBLY, 15 AND 25 VOLT DC REGULATOR: 42498 dwg D43962G1.	5-50A
C1		CAPACITOR: MIL type CL65BH151MP3.	5-53
C2		Same as C1.	5-53
C3		CAPACITOR: MIL type CK05CW121K.	5-53
C4		Same as C3.	5-53
C5		CAPACITOR: MIL type CS13BE155K.	5-53
C6		Same as C5.	5-53
C7		Same as C1.	5-53
C8		CAPACITOR: MIL type CS13BF476K.	5-53
C9		Same as C1.	5-53
C10		Same as C8.	5-53
CR1		SEMICONDUCTOR: MIL type 1N758A.	5-53
CR2		Not used.	
CR3		Same as CR1.	5-53
CR4 thru CR6		Not used.	
CR7		SEMICONDUCTOR: MIL type 1N821.	5-53
CR8		Not used.	
CR9		Same as CR7.	5-53
Q1		TRANSISTOR: MIL type 2N2222.	5-53
Q2 thru Q6		Same as Q1.	5-53
R1		RESISTOR: MIL type RC07GF391K.	5-53
R2		RESISTOR: MIL type RC07GF183K.	5-53
R3		RESISTOR: MIL type RC07GF221K.	5-53
R4		Same as R2.	5-53
R5		Not used.	
R6		RESISTOR: MIL type RC07GF222K.	5-53
R7		Not used.	
R8		RESISTOR: MIL type RC07GF273K.	5-53
R9		RESISTOR: MIL type RC07GF122K.	5-53
R10		RESISTOR: MIL type RC07GF682K.	5-53
R11		Same as R8.	5-53
R12		RESISTOR: MIL type RC07GF562K.	5-53
R13		Same as R10.	5-53
R14		Same as R12.	5-53
R15		RESISTOR: MIL type RN60D1372F.	5-53
R16		RESISTOR: MIL type RN60D4641F.	5-53
R17		RESISTOR: MIL type RN60D6811F.	5-53
R18		RESISTOR: MIL type RN60D4751F.	5-53

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A2A3		PRINTED CIRCUIT BOARD SUBASSEMBLY, +125V RECTIFIER, REGULATOR AND FILTER: 42498 dwg D44001G1.	5-50A
C1		CAPACITOR: MIL type CL65BP140MP3.	5-50
C2		Same as C1.	5-50
C3		CAPACITOR: MIL type CL65BP250MP3.	5-50
C4		Same as C3.	5-50
C5		CAPACITOR: MIL type CK06CW103K.	5-50
C6		Same as C5.	5-50
C7		CAPACITOR: MIL type M18312/01-0436.	5-50
C8		Same as C7.	5-50
C9		Same as C5.	5-50
CR1		SEMICONDUCTOR: MIL type 1N645.	5-50
CR2		Same as CR1.	5-50
CR3		SEMICONDUCTOR: MIL type 1N967B.	5-50
CR4		SEMICONDUCTOR: MIL type 1N914.	5-50
CR5		Same as CR4.	5-50
CR6		SEMICONDUCTOR: MIL type 1N985B.	5-50
CR7		SEMICONDUCTOR: MIL type 1N758A.	5-50
CR8		Same as CR4.	5-50
CR9		Same as CR4.	5-50
CR10		SEMICONDUCTOR: MIL type 1N821.	5-50
Q1		TRANSISTOR: MIL type 2N1893.	5-50
Q2		Same as Q1.	5-50
Q3		TRANSISTOR: MIL type 2N2222.	5-50
Q4 thru Q6		Same as Q3.	5-50
R1		Not used.	
R2		RESISTOR: MIL type RC07GF104K.	5-50
R3		Same as R2.	5-50
R4		RESISTOR: MIL type RC07GF471K.	5-50
R5		Not used.	
R6		RESISTOR: MIL type RC07GF183K.	5-50
R7		RESISTOR: MIL type RC07GF123K.	5-50
R8		RESISTOR: MIL type RC07GF270K.	5-50
R9		Same as R7.	
R10		Same as R8.	5-50
R11		RESISTOR: MIL type RC07GF680K.	5-50
R12		RESISTOR: MIL type RC07GF122K.	5-50
R13		RESISTOR: MIL type RC07GF153J.	5-50
R14		RESISTOR: MIL type RC07GF682K.	5-50
R15		Same as R13.	5-50
R16		RESISTOR: MIL type RN65C1003F.	5-50
R17		RESISTOR: MIL type RN60C4871F.	5-50
R18		RESISTOR: MIL type RC07GF472J.	5-50
R19		RESISTOR: MIL type RC07GF124J.	5-50
R20		RESISTOR: MIL type RC32GF101K.	5-50

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
PS1A3		PRINTED CIRCUIT BOARD SUBASSEMBLY, SWITCHING REGULATORS: 42498 dwg D46524G1.	5-49
C1		CAPACITOR: MIL type CK06CW103K.	5-54
C2		CAPACITOR: MIL type CS13BE156K.	5-54
C3		Same as C1.	5-54
C4		CAPACITOR: MIL type CK06BX104K.	5-54
C5		CAPACITOR: MIL type CL65BH151MP3.	5-54
C6		Same as C1.	5-54
C7		Same as C5.	5-54
C8		Same as C1.	5-54
C9		Same as C4.	5-54
CR1		SEMICONDUCTOR: MIL type 1N3064.	5-54
CR2		SEMICONDUCTOR: MIL type 1N821.	5-54
CR3		SEMICONDUCTOR: MIL type 1N967B.	5-54
CR4		SEMICONDUCTOR: MIL type 1N914.	5-54
CR5		SEMICONDUCTOR: MIL type 1N756A.	5-54
CR6		Same as CR4.	5-54
Q1		TRANSISTOR: MIL type 2N2907A.	5-54
Q2		TRANSISTOR: MIL type 2N2905A.	5-54
Q3		TRANSISTOR: MIL type 2N2222.	5-54
Q4		Same as Q1.	5-54
R1		RESISTOR: MIL type RC07GF222K.	5-54
R2		RESISTOR: MIL type RC07GF471K.	5-54
R3		RESISTOR: MIL type RC07GF102J.	5-54
R4		RESISTOR: MIL type RC07GF153J.	5-54
R5		RESISTOR: MIL type RC07GF473K.	5-54
R6		RESISTOR: MIL type RC32GF102K.	5-54
R7		RESISTOR: MIL type RC07GF472K.	5-54
R8		RESISTOR: MIL type RC07GF331K.	5-54
R9		RESISTOR: MIL type RC07GF104K.	5-54
R10		RESISTOR: MIL type RW69V680.	5-54
R11		RESISTOR: MIL type RC07GF100K.	5-54
R12		RESISTOR: MIL type RC07GF101K.	5-54
R13		RESISTOR: MIL type RC07GF330K.	5-54
R14		RESISTOR: MIL type RC07GF102J.	5-54
R15		RESISTOR: MIL type RC07GF182K.	5-54
R16		RESISTOR: MIL type RC07GF223K.	5-54
R17		RESISTOR: MIL type RC07GF682K.	5-54
R18		RESISTOR: MIL type RT12C2P102.	5-54
R19		RESISTOR: MIL type RC07GF152J.	5-54
R20		Same as R2.	5-54
Z1		INTEGRATED CIRCUIT, LOGIC GATE: High speed differential comparator; plus 14v positive supply voltage, minus 7v negative supply voltage, 10 ma, 300 MW internal power dissipation; 42498 dwg A42423-10; 14433 type U5B7710-31X.	5-54

TABLE 6-2. MAINTENANCE PARTS LIST (Cont)

REF DESIG	NOTES	NAME AND DESCRIPTION	FIG. NO.
		SUPPLIED WITH BUT NOT PART OF EQUIPMENT	
		SPECIAL TOOLS AND EQUIPMENT	
		CABLE ASSEMBLY, RF: C/o one connector plug MIL type MS18176-1 on one end and one connector plug MIL type MS18177-1 on the other end; one strand of cable MIL type RG196U, 10 in lg; 42498 dwg C45138G1.	
		CABLE ASSEMBLY, RF: C/o one connector plug 42498 dwg A42559-3; 81312 type MRAC26PG7 on one end and one connector plug 42498 dwg A42560-3, 81312 type MRAC26SG7 on the other end; 10 strands of cable MIL type RG196U, 10 in lg; 42498 dwg C45148G1.	
		CABLE ASSEMBLY, RF: C/o one connector plug MIL type MS18176-1 on one end and one connector plug MIL type MS18177-1 on the other end; 7 strands of cable MIL type RG196U, 10 in lg; 42498 dwg C45149G1.	
		CABLE ASSEMBLY, RF: C/o one connector plug MIL type MS18176-1 on one end and one connector plug MIL type MS18177-1 on the other end; 12 strands of cable MIL type RG196U, 10 in lg; 42498 dwg C45149G2.	
		CARD, EXTENDER: For use with printed circuit board A5; 42498 dwg D45184G1.	
		CARD, EXTENDER: For use with printed circuit boards A10 and A17; 42498 dwg E45170G1.	
		CARD, EXTENDER: For use with printed circuit board A12A7A1, 42498 dwg D46442G1.	
		CARD, EXTENDER: For use with printed circuit boards A12A1 to A6; 42498 dwg D46442G2.	
		CONNECTOR: MIL type MS3108R14S-7S.	
		CONNECTOR: MIL type MS3116F20-39SX.	
		CONNECTOR: MIL type MS3116F14-19S.	
		EXTRACTOR, PRINTED CIRCUIT BOARD: 42498 dwg B43412G1.	
		EXTRACTOR, PRINTED CIRCUIT BOARD: 42498 dwg B45837G1.	

TABLE 6-3. LIST OF MANUFACTURERS

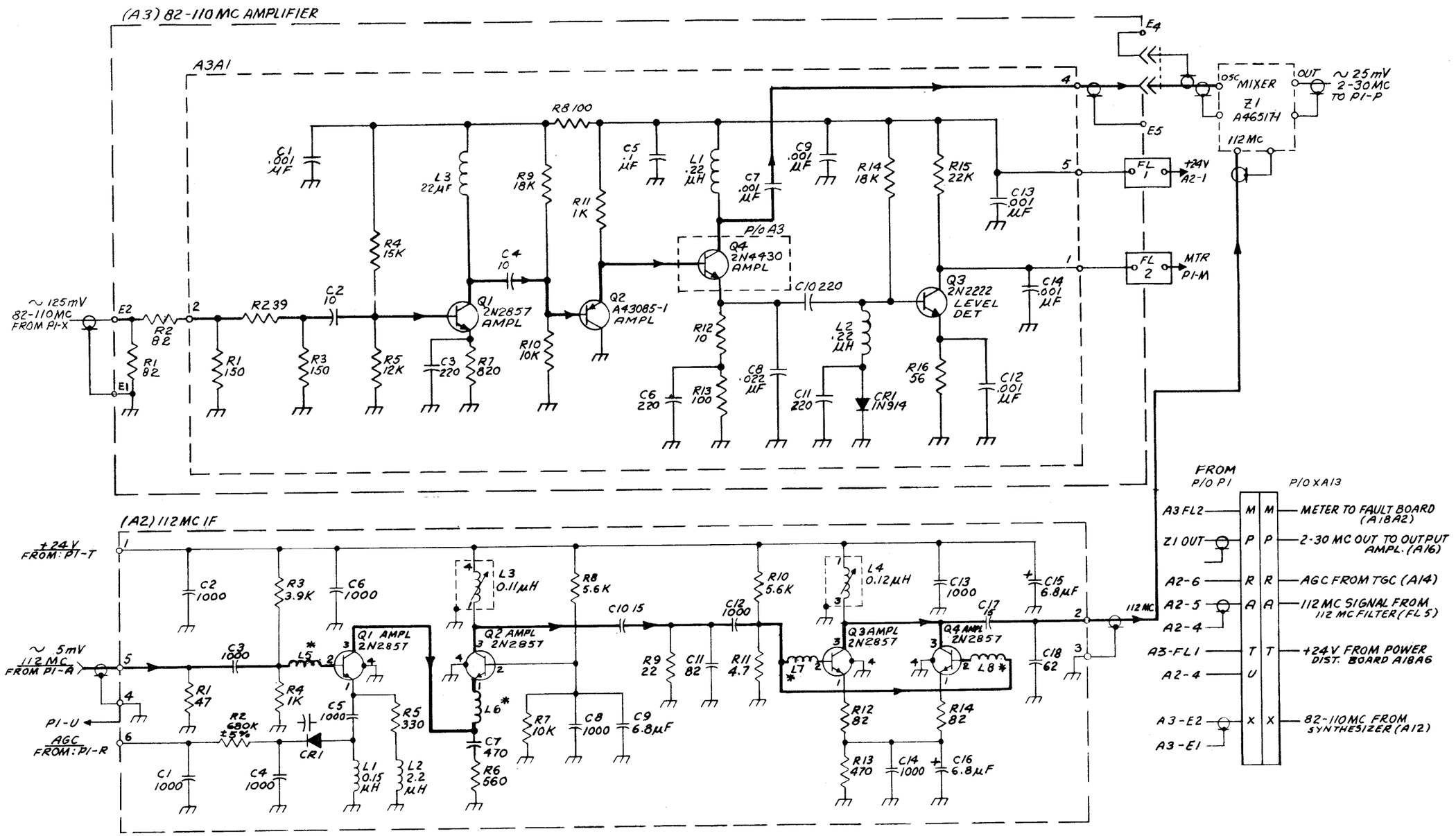
MFR CODE	NAME	ADDRESS
01121	Allen-Bradley Co.	1201 South 2nd Street Milwaukee, Wis. 53204
01281	TRW Semiconductors, Inc.	14520 Avaiation Blvd Lawndale, Calif. 90260
01295	Texas Instruments, Inc. Semi-conductor-Components Division	13500 North Central Express Way, Dallas, Texas 75231
02114	Ferroxcube Corp. of America	Mt. Marion Rd. Saugerties, N. Y. 12477
04713	Motorola Semiconductor Products, Inc.	5005 East McDowell Rd. Phoenix, Ariz. 85008
07263	Fairchild Camera and Instrument Corp. Semiconductor Division	313 Frontage Rd. Mountain View, Calif. 94040
08815	New England Instrument Co.	H. F. Brown Way Natick, Mass. 01760
12965	Computer Components, Inc.	88-06 Van Wyck Express Way Jamaica, N. Y. 11418
13327	Solitron Devices, Inc.	256 Oak Tree Rd. Tappan, N. Y. 10983
13619	RF Interonics, Inc.	100 Pine Aire Drive Bayshore, L.I., New York 11706
13715	Fairchild Camera and Instrument Corp. Semiconductor Division Diode Plant	4300 Redwood Highway San Rafael, Calif. 94902
13923	Communications Products Department of the Norden Division of United Air-craft Corp.	Trevose, Pa. 19047
14433	ITT Semiconductors A Division of International Telephone and Telegraph Corp.	3301 Electronics Way West Palm Beach, Fla 33401
14674	Corning Glass Works	Houghton Park Corning, N. Y. 14830
14936	General Instrument Corp. Semi-conductor Products Group	P. O. Box 600 6000 W. John Street Hicksville, N. Y. 11802
17117	Electronic Molding Corp.	40 Church Street Pawtucket, R. I. 02860
25140	Globe Industries, Division of TRW Inc.	2275 Stanley Ave. Dayton, Ohio 45404

TABLE 6-3. LIST OF MANUFACTURERS (Cont)

MFR CODE	NAME	ADDRESS
42498	National Radio Company, Inc.	89 Washington Street Melrose, Mass. 02176
46859	Philco-Ford Corp.	C and Tioga Streets Philadelphia, Pa. 19134
72982	Erie Technological Products, Inc.	644 W. 12th Street Erie, Pa. 16512
74868	Amphenol Corp., Amphenol RF Div.	33 E. Franklin Street Danbury, Conn. 06810
76493	Miller, J.W. Co.	5915 S. Main Street Los Angeles, Calif. 90003
76854	Oak Mfg Co., Division of Oak Electro/Netics Corp.	South Main Street Crystal Lake, Ill. 60014
77342	American Machine and Foundry Co. Potter and Brumfield Division	1200 E. Broadway P.O. Box 522 Princeton, Ind. 47570
80207	Unimax Switch, Division of Maxson Electronics Corp.	Ives Road Wallingford, Conn. 06493
80294	Bourns, Inc.	1200 Columbia Ave. Riverside, Calif. 92507
81312	Winchester Electronics Division Litton Industries, Inc.	Main Street and Hillside Ave. Oakville, Conn. 06779
81541	Airpax Electronics, Inc.	Woods Road Cambridge, Md. 21613
81840	Ledex, Inc.	123 Webster Street Dayton, Ohio 45402
82567	Reeves-Hoffman	Cherry and North Streets Carlisle, Penn. 17013
82716	Richardson-Merrell, Inc.	122 East 42nd Street New York, N.Y. 10017
92966	Hudson Lamp Co.	526 Elm Street Kearny, N.J. 07032
94375	Automatic Metal Products Corp.	315-323 Berry Street Brooklyn, N.Y. 11211
95238	Continental Connector Corp.	34-63 56th Street Woodside, N.Y. 11377
95275	Vitramon, Inc.	Box 544 Bridgeport, Conn. 06601

TABLE 6-3. LIST OF MANUFACTURERS (Cont)

MFR CODE	NAME	ADDRESS
96095	Aerovox Corp.	Seneca Avenue Olean, N. Y. 14760
96182	Master Specialties Co.	1640 Monrovia Costa Mesa, Calif. 92627
98291	Sealectro Corp.	225 Hoyt Mamaroneck, N. Y. 10544



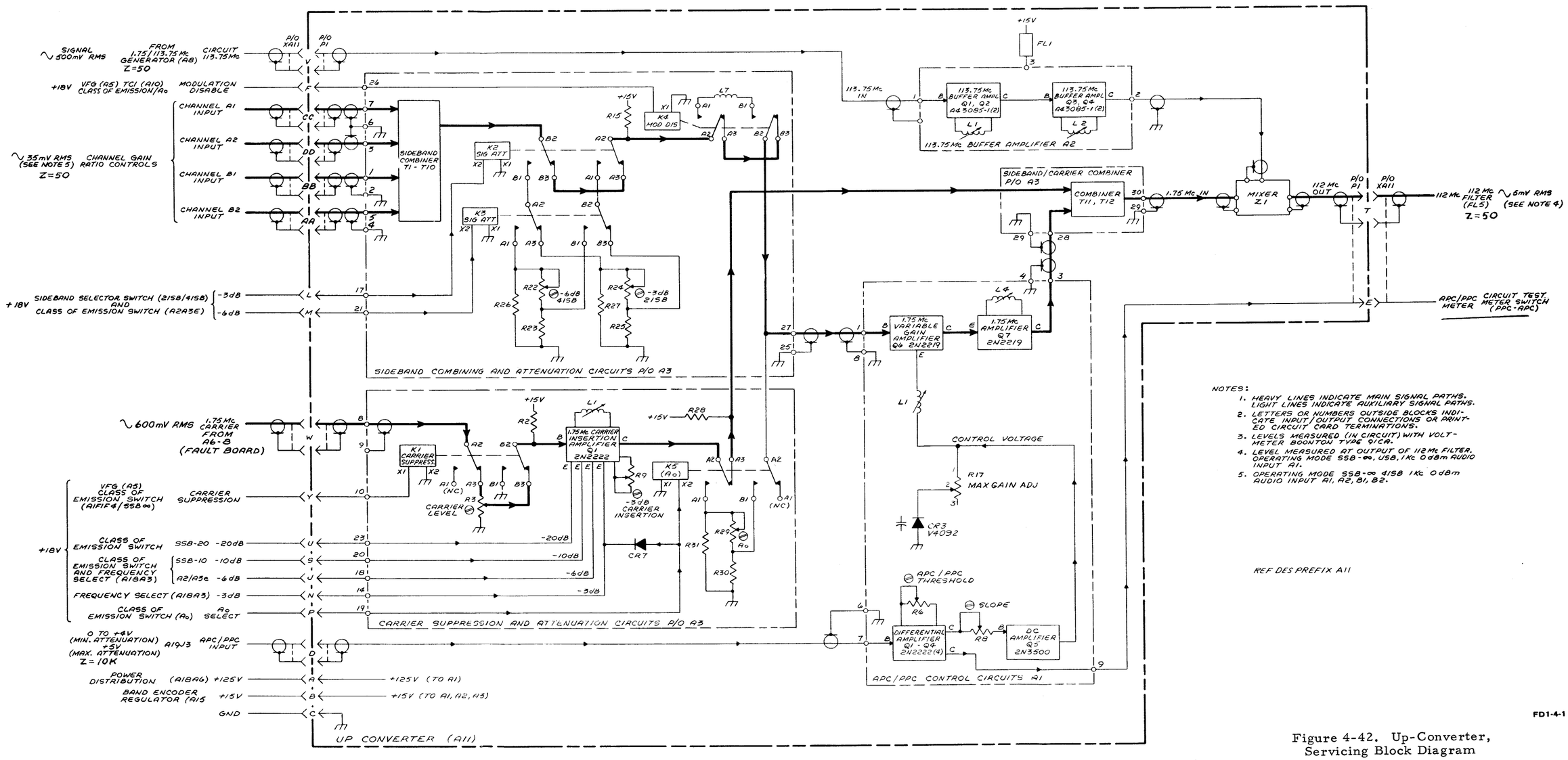
NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W, ±10% AND ARE GIVEN IN OHMS. K=1000 OHMS.
2. UNLESS OTHERWISE SPECIFIED ALL CAPACITOR VALUES ARE GIVEN IN PICO FARADS.
3. REF DES PREFIX A13.
4. FOR EXTERNAL CONNECTIONS SEE FIG. 5-90.

* FERRITE BEAD CHOKES

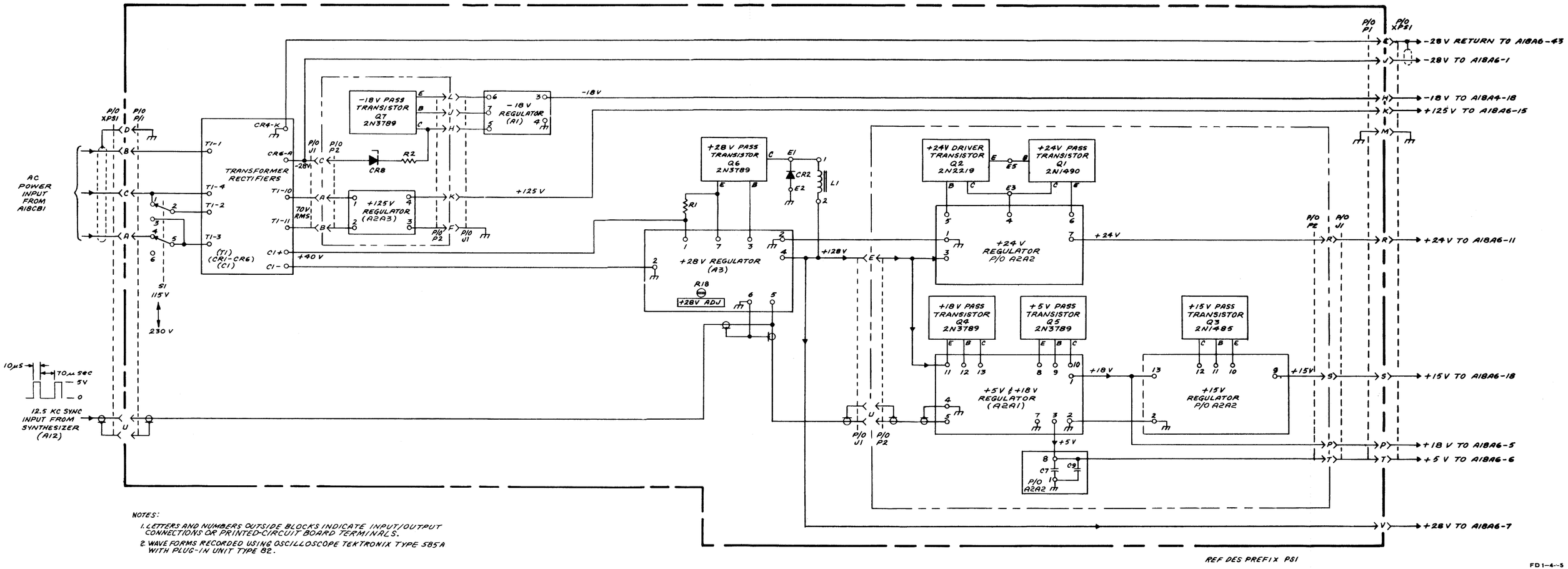
FD1-5-21

Figure 5-79. Down-Converter A13, Schematic Diagram



NOTES:
1. HEAVY LINES INDICATE MAIN SIGNAL PATHS. LIGHT LINES INDICATE AUXILIARY SIGNAL PATHS.
2. LETTERS OR NUMBERS OUTSIDE BLOCKS INDICATE INPUT/OUTPUT CONNECTIONS OR PRINTED CIRCUIT CARD TERMINATIONS.
3. LEVELS MEASURED (IN CIRCUIT) WITH VOLTMETER BOONTON TYPE 91CA.
4. LEVEL MEASURED AT OUTPUT OF 112 Mc FILTER. OPERATING MODE SSB-∞, USB, 1Kc 0dBm AUDIO INPUT A1.
5. OPERATING MODE SSB-∞ 41SB 1Kc 0dBm AUDIO INPUT A1, A2, B1, B2.

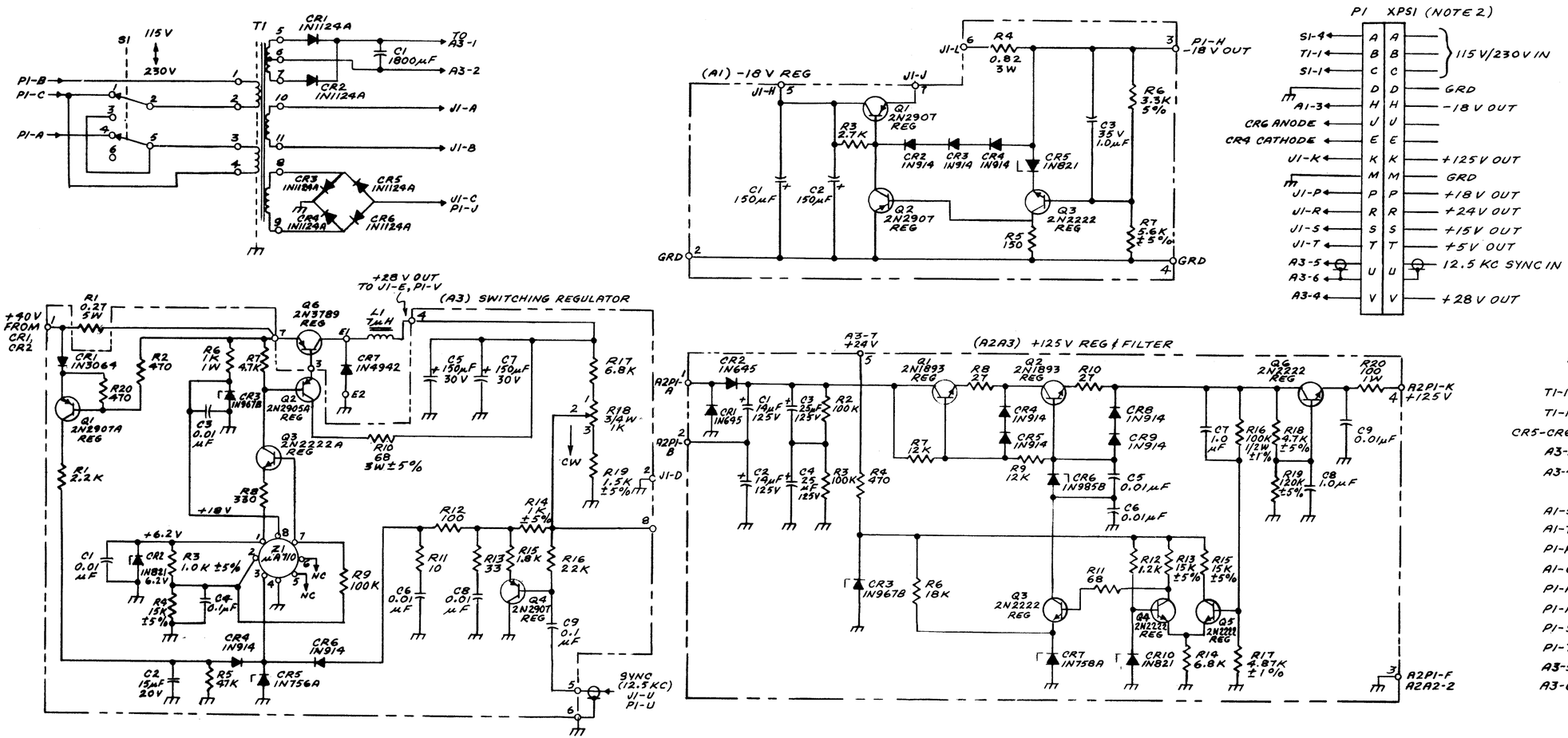
Figure 4-42. Up-Converter, Servicing Block Diagram



NOTES:

1. LETTERS AND NUMBERS OUTSIDE BLOCKS INDICATE INPUT/OUTPUT CONNECTIONS OR PRINTED-CIRCUIT BOARD TERMINALS.
2. WAVE FORMS RECORDED USING OSCILLOSCOPE TEKTRONIX TYPE 585A WITH PLUG-IN UNIT TYPE 82.

Figure 4-52. Power Supply, Servicing Block Diagram



FD1-5-15

Figure 5-63. Power Supply PS1, Schematic Diagram (Sheet 1 of 2)

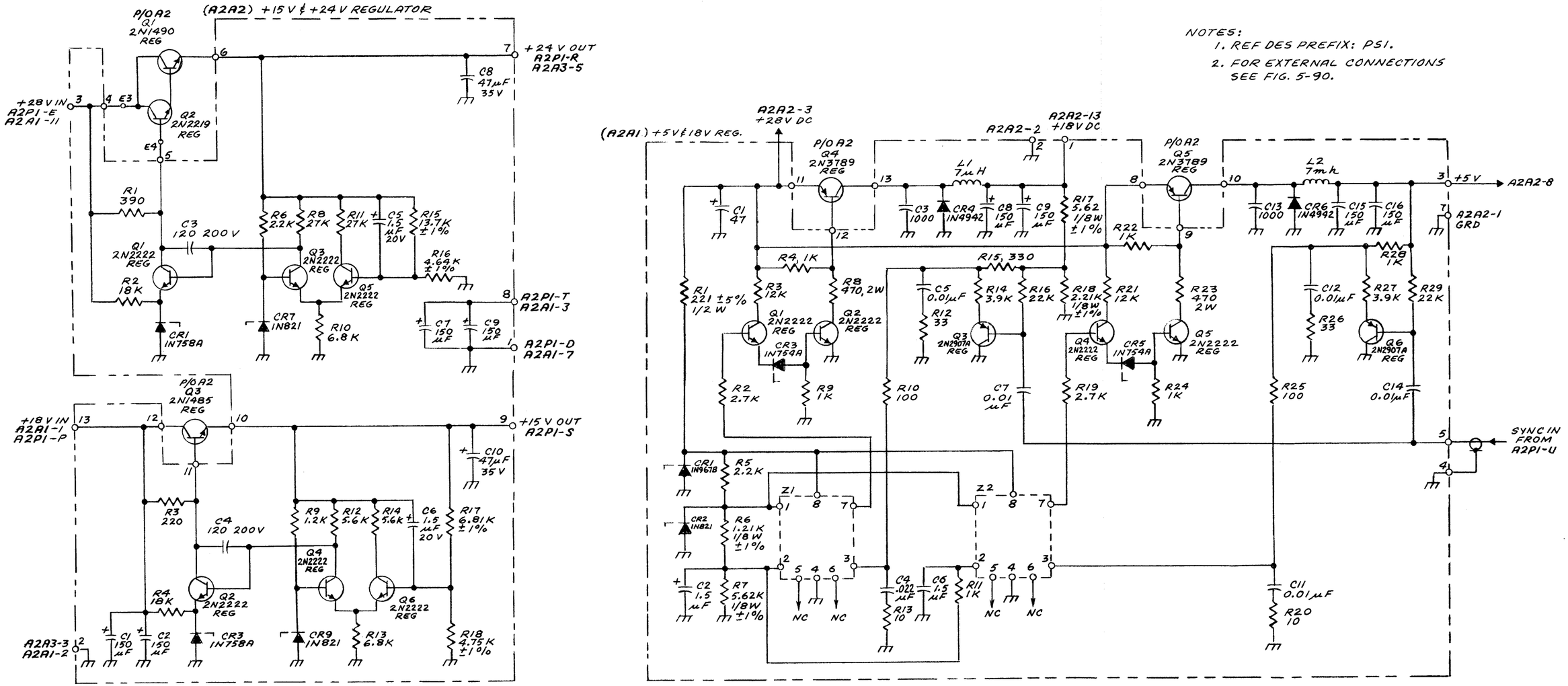
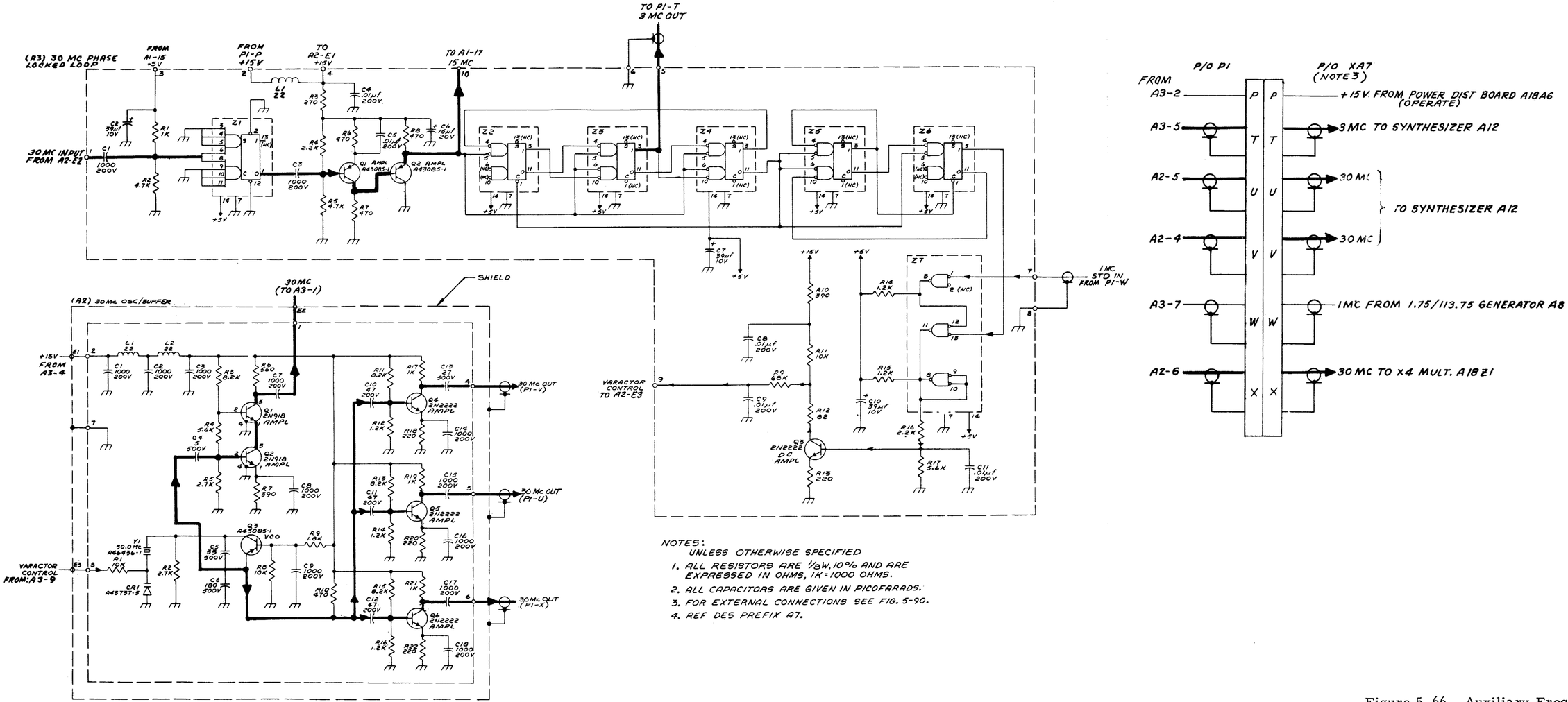


Figure 5-63. Power Supply PS1, Schematic Diagram (Sheet 2 of 2)

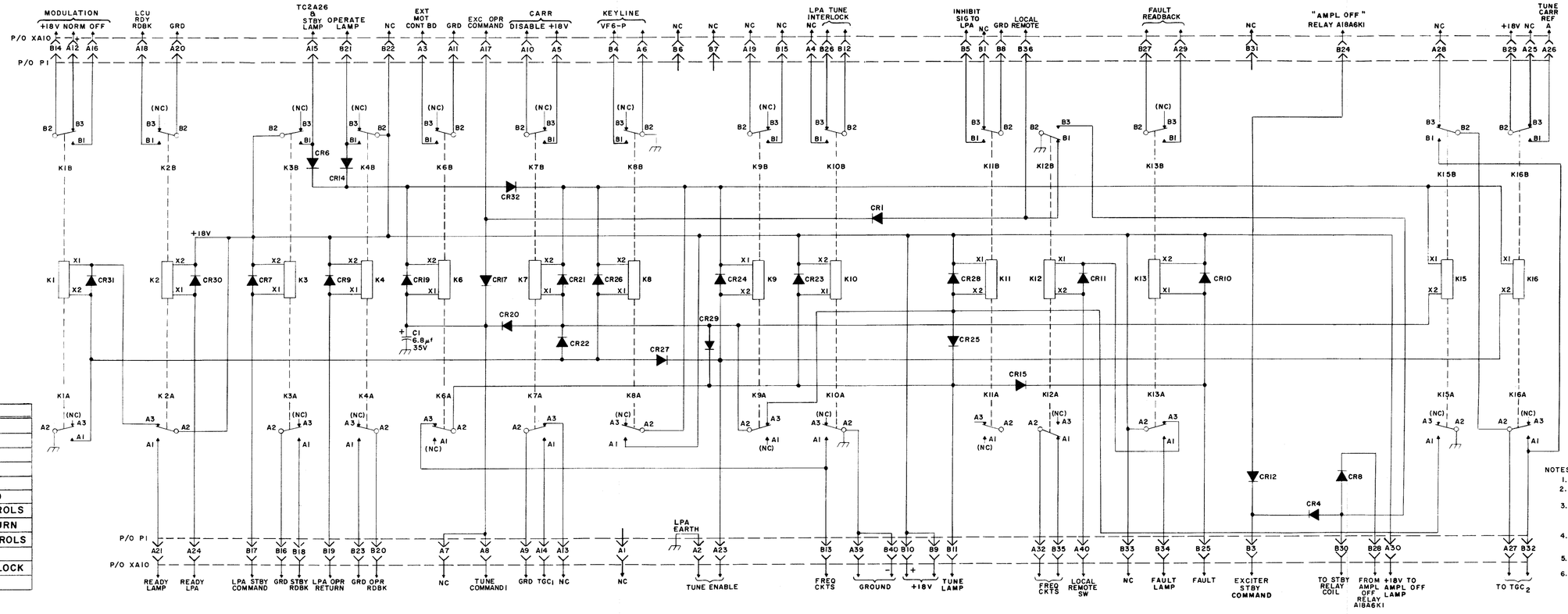


NOTES:
UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE 1/8W, 10% AND ARE EXPRESSED IN OHMS, 1K = 1000 OHMS.
2. ALL CAPACITORS ARE GIVEN IN PICOFARADS.
3. FOR EXTERNAL CONNECTIONS SEE FIG. 5-90.
4. REF DES PREFIX A7.

FD1-5-16

Figure 5-66. Auxiliary Frequency Generator A7, Schematic Diagram (Sheet 2 of 2)



NOTES:
1. ALL DIODES ARE IN483B.
2. CR2 & CR3 REF DESIGNATIONS ARE NOT USED.
3. THE FOLLOWING CONTACTS ON CARD ARE SPARES; A22, A31, A33 THRU A38, B1, B2, B37, B38 & B39.
4. RELAY CONTACTS IN UNENERGIZED POSITION EXCEPT FOR K12.
5. FOR EXTERNAL CONNECTIONS SEE FIG. 5-87.
6. REF DES PREFIX A10.

FD1-5-17

LEGEND

RELAY SYMBOL	FUNCTION
K1	MODULATION
K2	READY RETURN
K3	STANDBY RETURN
K4	OPERATE RETURN
K5	NOT USED
K6	ACTIVATE COMMAND
K7,K8,K15	TGC & CARR CONTROLS
K9,K16	TUNE ENABLE RETURN
K10	FREQ & MODE CONTROLS
K11	LPA INHIBIT
K12	FAULT/STBY INTERLOCK
K13	FAULT

Figure 5-69. Transmitter Control No. 1 A10, Schematic Diagram

PARTS LOCATION INDEX

1.75 (MHz) IF Amplifier (A1)				Carrier Insertion (A3)			
REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	J16	R2	G19	C1	J3	R11	K7
C2	I12	R3	J19	C2	H5	R12	F9
C3	I13	R4	G19	C3	F6	R13	G8
C4	J17	R5	G21	C4	F7	R14	I7
C5	J16	R6	G22	C5	G7	R15	E8
C6	H16	R7	J22	C6	H6	R16	G9
C7	H15	R8	H21	C7	H7	R17	K8
C8	H16	R9	H22	C8	H8	R18	I8
C9	H14	R10	H21	C9	H9	R19	K8
C10	I14	R11	J21	CR1	H3	R20	I9
CR1	I21	R12	H22	CR2	J6	R21	K10
CR2	I21	R13	K22	CR3	J7	R22	D9
CR3	K19	R14	J23	CR4	J8	R23	E10
L1	J18	R15	J21	CR5	J9	R24	E10
L2	H18	R16	K22	CR6	C14	R25	E10
L3	J13	R17	K20	CR7	D15	R26	D10
L4	H14	R18	I11	K1	G4	R27	E10
Q1	I18	R19	J11	K2	C8	R28	F12
Q2	I19	R20	J12	K3	C9	R29	D12
Q3	I20	R21	H12	K4	B12	R30	E12
Q4	I20	R22	J12	K5	D12	R31	D13
Q5	I22	R23	J13	L1	G6	R32	Not used
Q6	I13	R24	H17	L2	I6	R33	Not used
Q7	H14	R25	J16	L3	J7	R34	F13
R1	J17	R26	J14	L4	J8	T1	B4
				L5	J9	T2	C4
Up Converter Buffer (A2)				L6	J10	T3	D4
C1	B17	Q3	B21	L7	C12	T4	E4
C2	B19	Q4	B22	R1	Not used	T5	B5
C3	B20	R1	C18	R2	G5	T6	D5
C4	C20	R2	B18	R3	J4	T7	C5
C5	B22	R3	B18	R4	C5	T8	D5
C6	B23	R4	B18	R5	E5	T9	D6
C7	C23	R5	B19	R6	G5	T10	D7
FL1	A20	R6	C20	R7	I5	T11	E14
L1	C20	R7	B20	R8	J6	T12	E15
L2	C22	R8	B21	R9	I6		
Q1	B18	R9	B21	R10	D6	Z1	E23
Q2	B19	R10	B22				

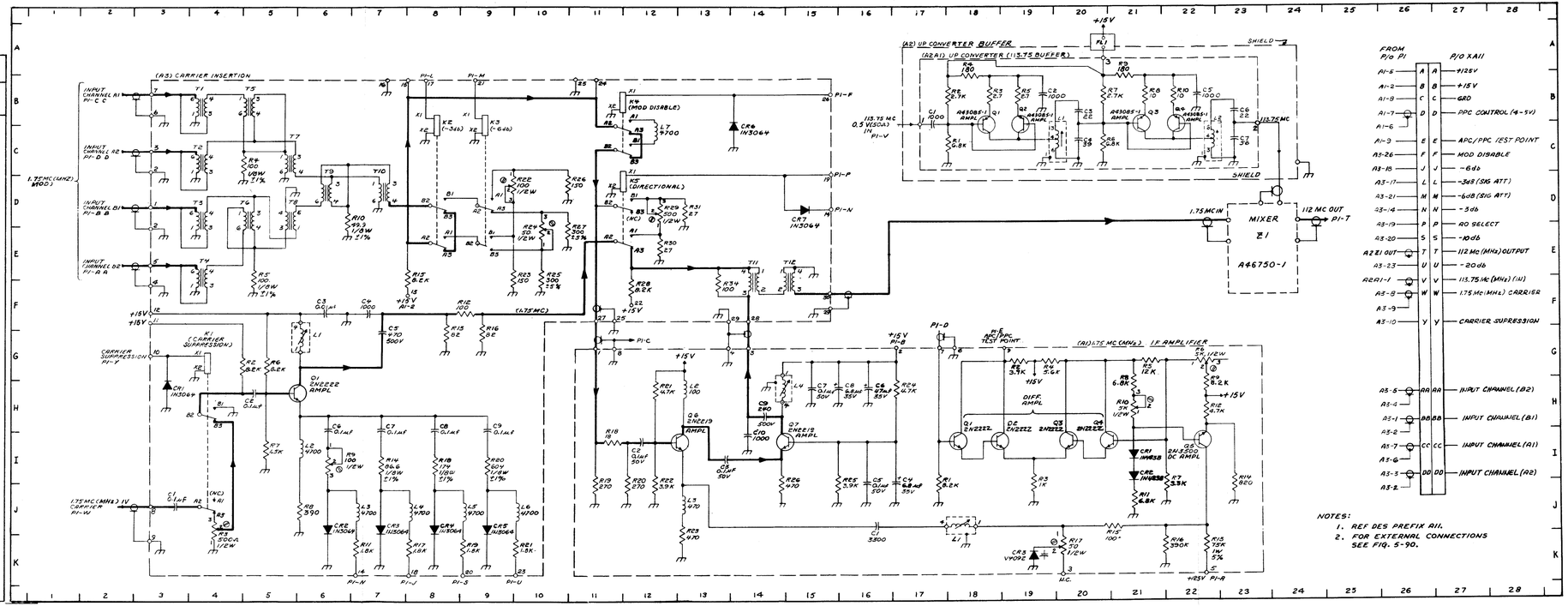


Figure 5-70. Up-Converter A11, Schematic Diagram

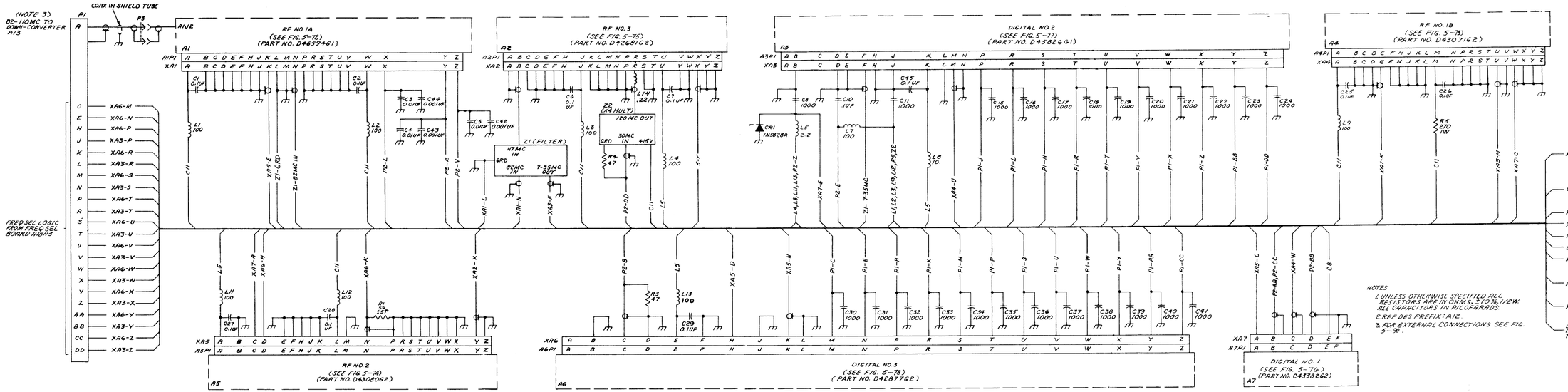
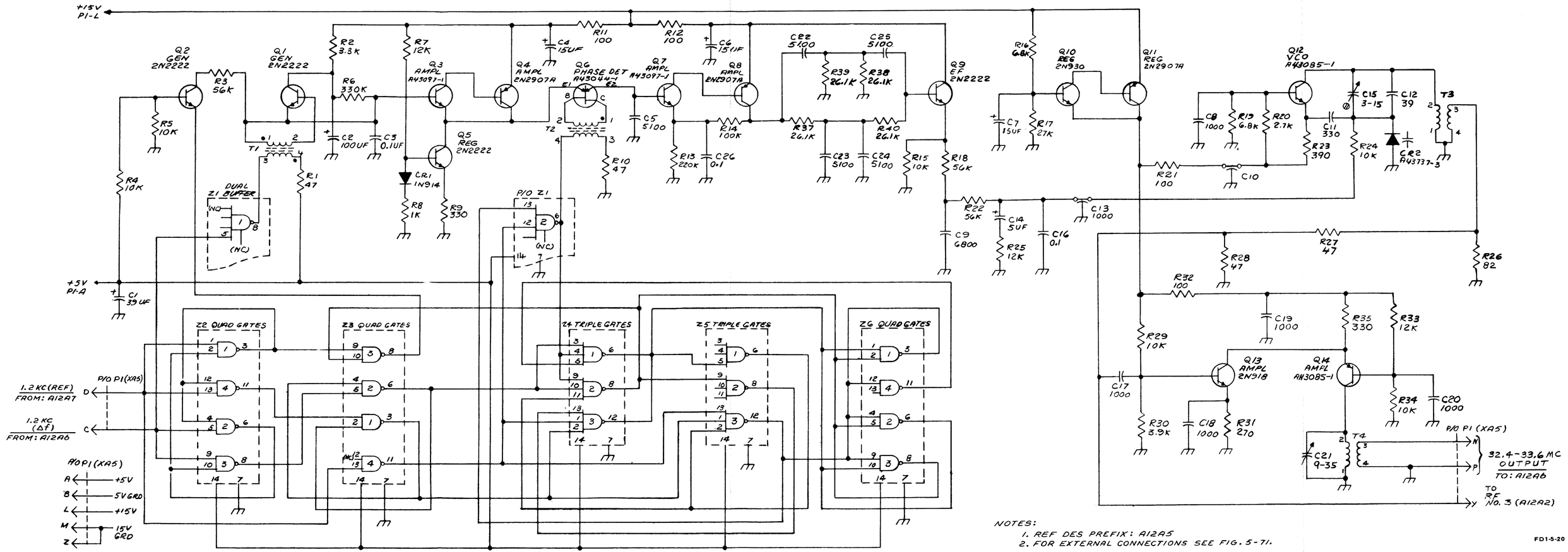


Figure 5-71. Synthesizer A12, Interconnection Diagram

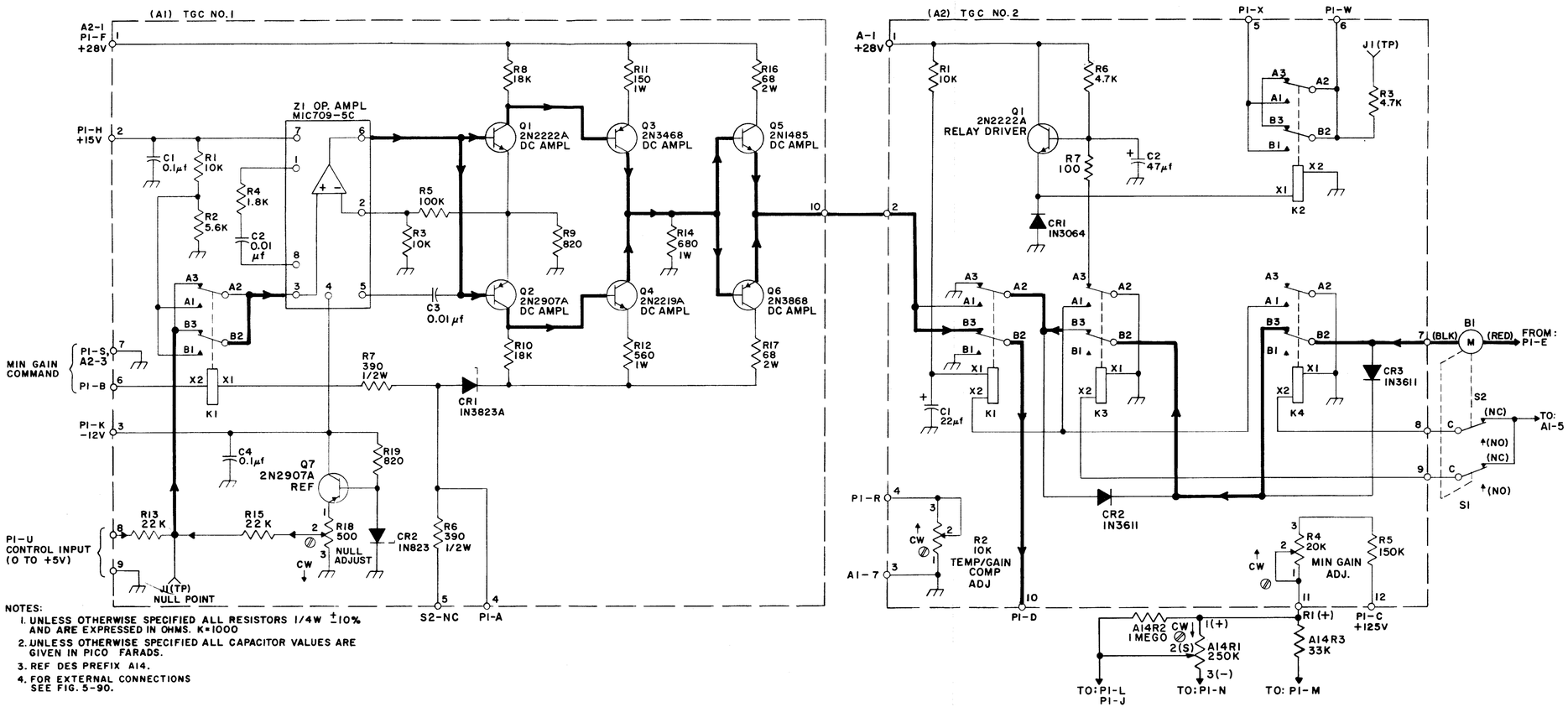
FD1-5-19



NOTES:
1. REF DES PREFIX: A12A5
2. FOR EXTERNAL CONNECTIONS SEE FIG. 5-71.

FD1-5-20

Figure 5-74. Card RF No. 2, p/o A12, Schematic Diagram

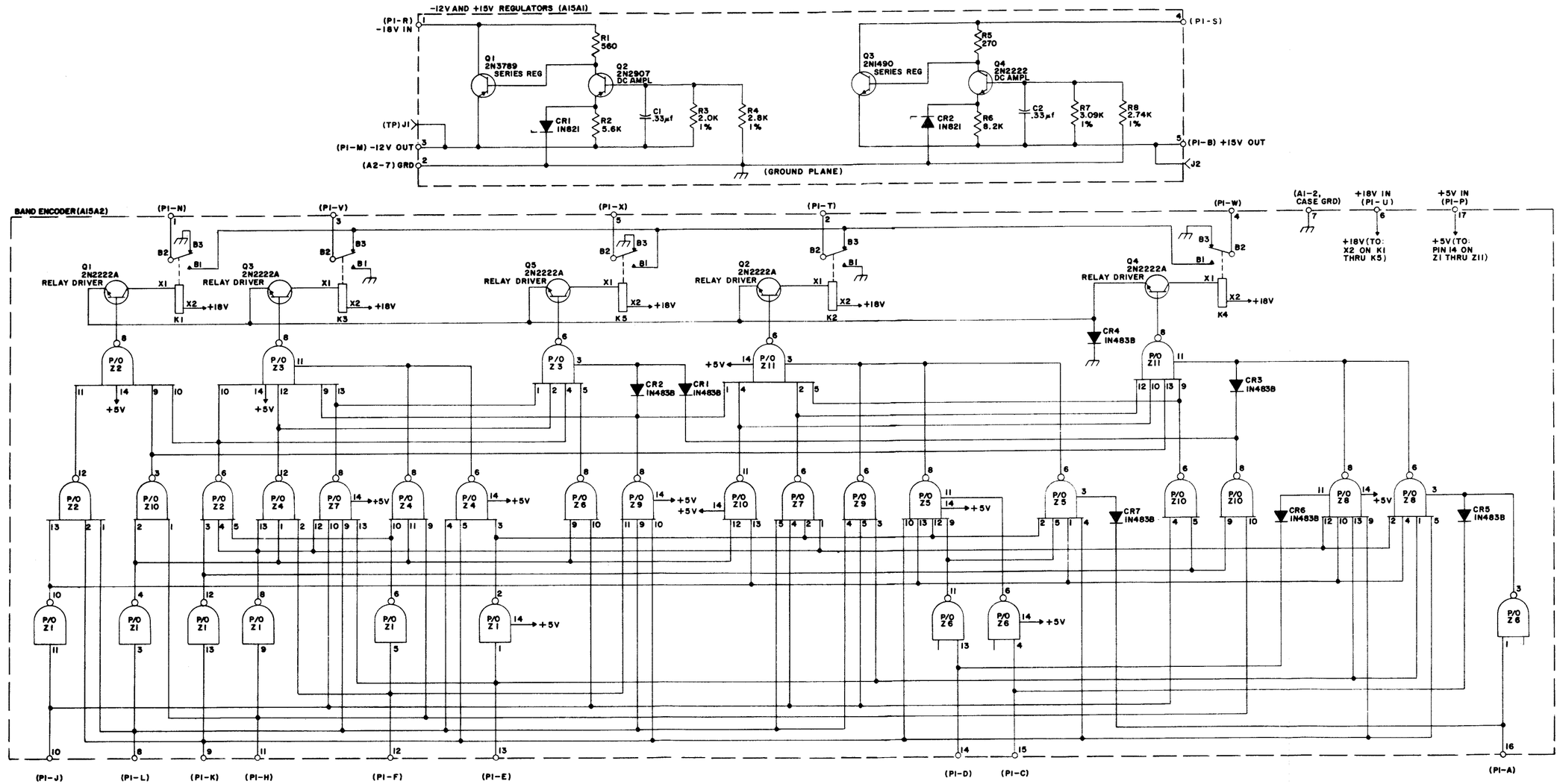


NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS 1/4W ±10% AND ARE EXPRESSED IN OHMS. K=1000
2. UNLESS OTHERWISE SPECIFIED ALL CAPACITOR VALUES ARE GIVEN IN PICO FARADS.
3. REF DES PREFIX A14.
4. FOR EXTERNAL CONNECTIONS SEE FIG. 5-90.

FROM			CIRCUIT
A1-4	A	A	-28 V FROM A18A6-19
A1-6	B	B	MIN GAIN COMMAND FROM TCI (A10)
A2-12	C	C	+125 V FROM A18A6-10
A2-10	D	D	TCI (A10)-A27 } K15/K16 CONTACTS CLOSED DURING TUNING CYCLE
B1 (RED)	E	E	TCI (A10)-B32 }
A1-1	F	F	+28 V FROM A18A6-8
1-2	H	H	+15 V FROM A18A6-25
R1-2(S)	J	J	TO MOTOR CONTROL (A18A5) TGC MON
A1-3	K	K	-12 V FROM A18A6-3
R1-2(S)	L	L	XA13-R
R3	M	M	A18R34-1
R1-3(-)	N	N	A18R34-2
	P	P	
A2-4	R	R	A18R34-3
A1-7	S	S	GRD
	T	T	
A1-8	U	U	CONTROL INPUT (0 TO +5 V)
A1-9			
A2-6	W	W	TUNE COMMAND FROM TCI (A10) B26
A2-5	X	X	TUNE COMMAND TO LPA VIA FL2-N

FD1-5-25

Figure 5-80. Transmitter Gain Control A14, Schematic Diagram

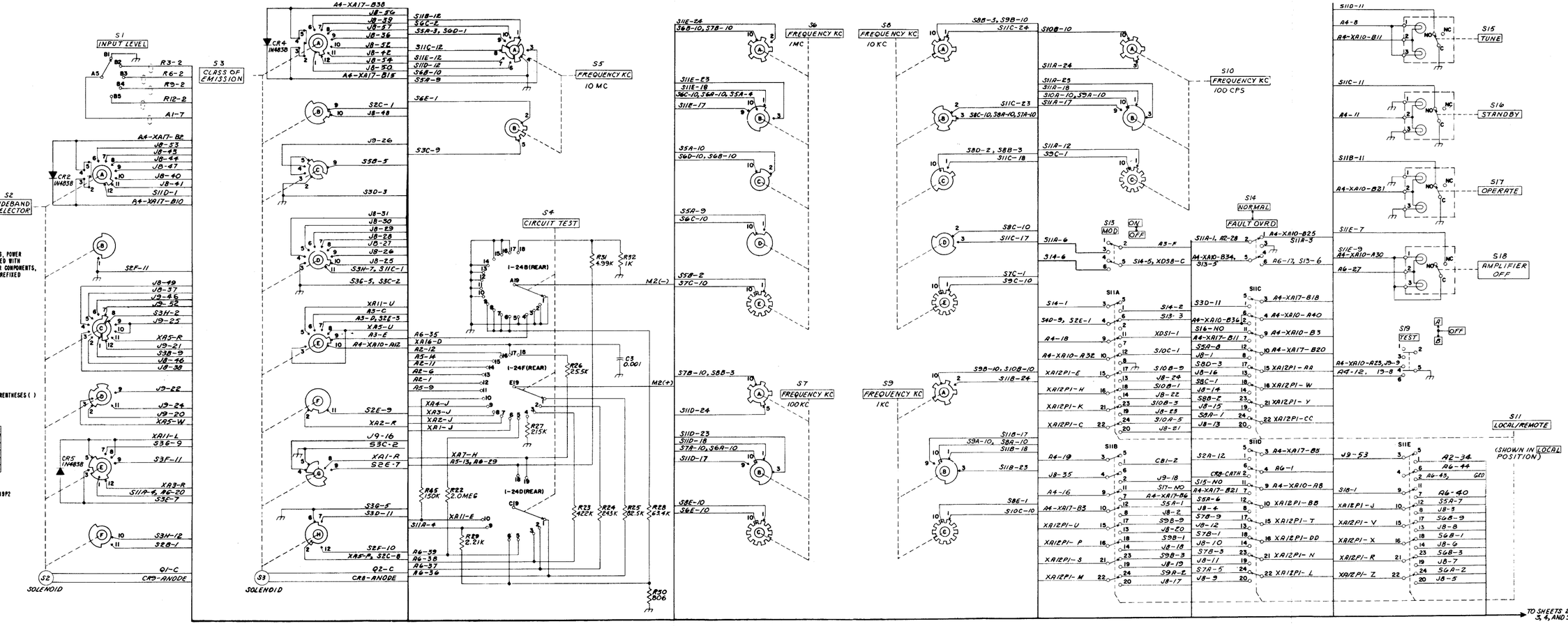


FROM	P1	XA15	NOTE 1
A2-16	A	A	S1
A1-5	B	B	+15V OUT
A2-15	C	C	S3
A2-14	D	D	S4
A2-13	E	E	S5
A2-12	F	F	S6
A2-11	H	H	S7
A2-10	J	J	S8
A2-9	K	K	S9
A2-8	L	L	S10
A1-3	M	M	-12 V OUT
A2-1	N	N	W1
A2-17	P	P	+5 V IN
A1-1	R	R	-18 V IN
A1-4	S	S	+18V IN (STBY)
A2-2	T	T	W2
A2-6	U	U	+18 V IN (OPR)
A2-3	V	V	W3
A2-4	W	W	W4
A2-5	X	X	W5

NOTES:
1. FOR EXTERNAL CONNECTIONS SEE FIG. 5-90.
2. REF DES PREFIX A15.

FD1-5-26

Figure 5-81. Band Encoder A15, Schematic Diagram



NOTES:
1. MODULES A1 THROUGH A17, MODULES A18A1 THROUGH A18A6, POWER SUPPLY PS1, AND FILTERS FL1 THROUGH FL5 ARE LABELED WITH THEIR COMPLETE REFERENCE DESIGNATORS. ALL OTHER COMPONENTS, INCLUDING SOCKETS XA1 THROUGH XA17, SHOULD BE PREFIXED BY A1B.

EXAMPLES:

LABELED REF DES	COMPLETE REF DES
A1	A1
XA1	A1BXA1
A18A1	A1BA1
FL3	FL3
Z1	A1BZ1
R34	A1BR34
J8	A1BJ8

2. ALL WIRING DESTINATIONS EXCEPT THOSE SHOWN IN PARENTHESES ( ) SHOULD BE PREFIXED BY A1B.

EXAMPLES:

LABELED DESTINATION	COMPLETE DESTINATION
XA1	A1BXA1
A6-1	A1BA6-1
(A8-1)	A8-1
R34-2	A1BR34-2
J8-C	A1BJ8-C

3. CONNECTORS J8 AND J9 (SHEET 5) MATE WITH A1DP1 AND A1DP2 (SEE FIGURE 5-91).

Figure 5-90. Modulator-Synthesizer MD-777/FRT, Front Panel and Chassis Assembly, Interconnection Diagram (Sheet 1 of 5) FD1-5-27

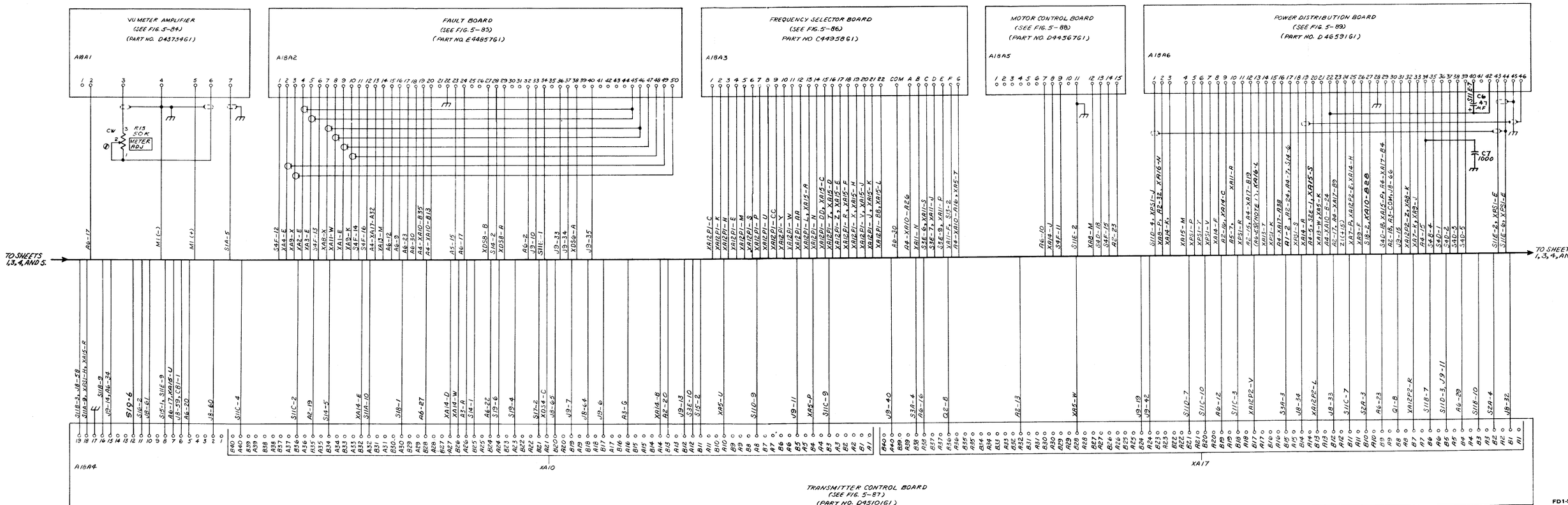


Figure 5-90. Modulator-Synthesizer MD-777/FRT, Front Panel and Chassis Assembly, Interconnection Diagram (Sheet 2 of 5)

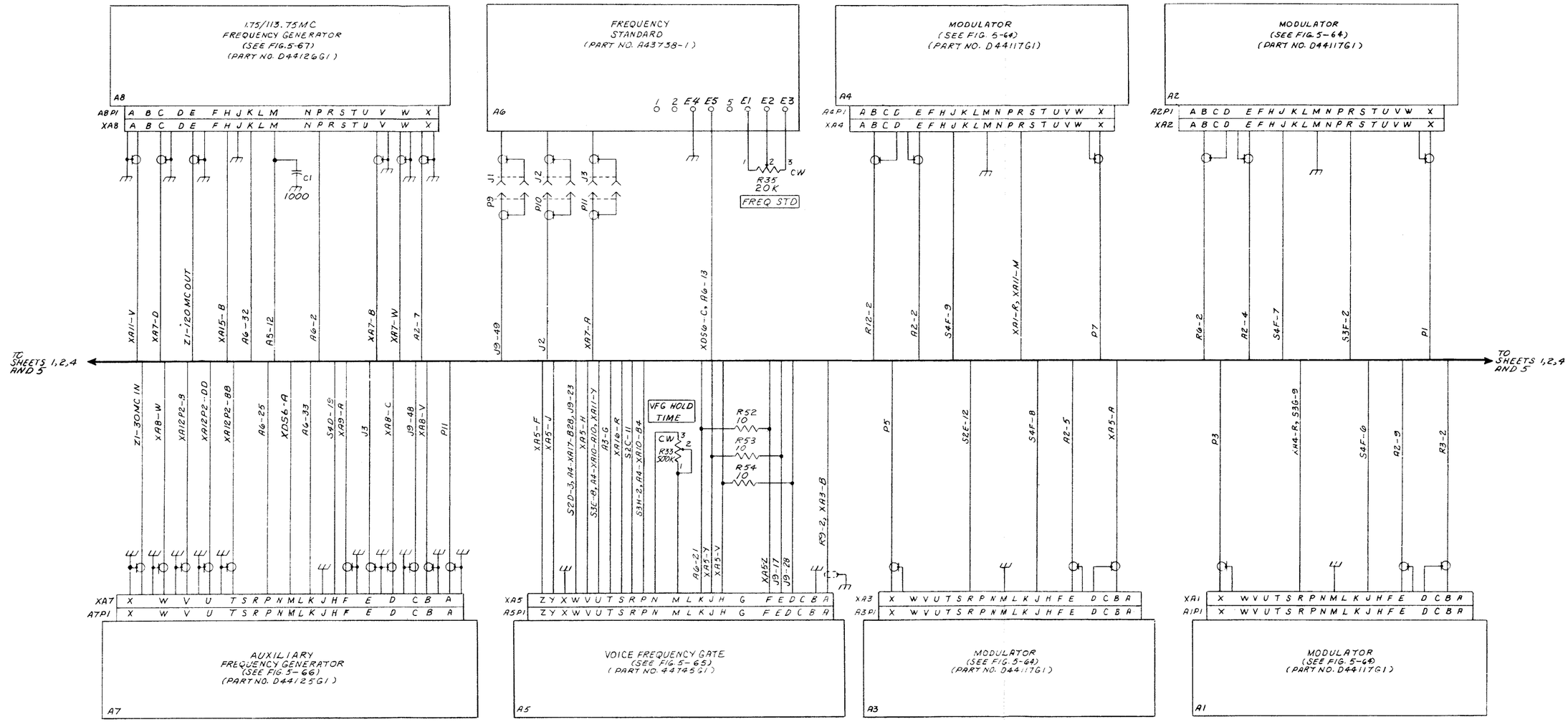


Figure 5-90. Modulator-Synthesizer MD-777/FRT, Front Panel and Chassis Assembly, Interconnection Diagram (Sheet 3 of 5)

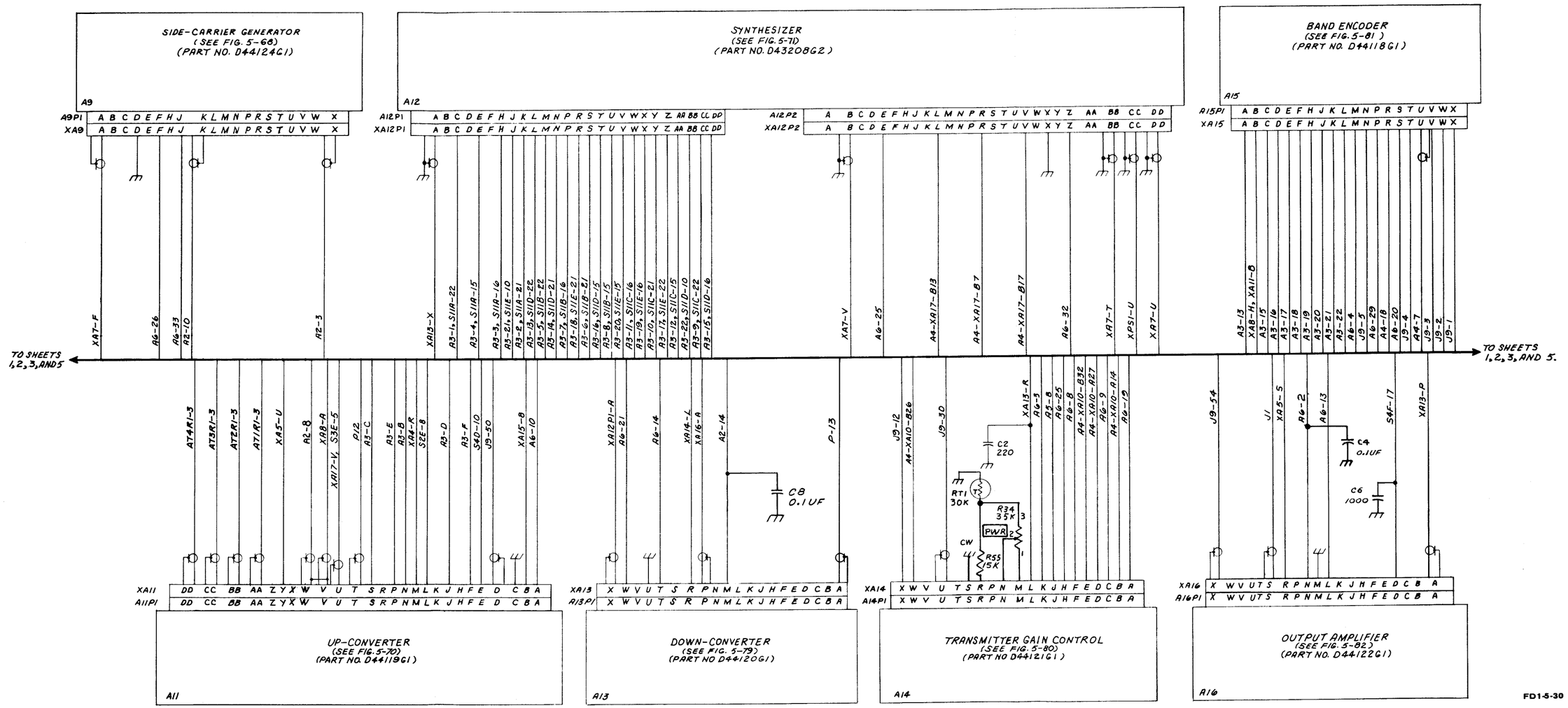


Figure 5-90. Modulator-Synthesizer MD-777/FRT, Front Panel and Chassis Assembly, Interconnection Diagram (Sheet 4 of 5)

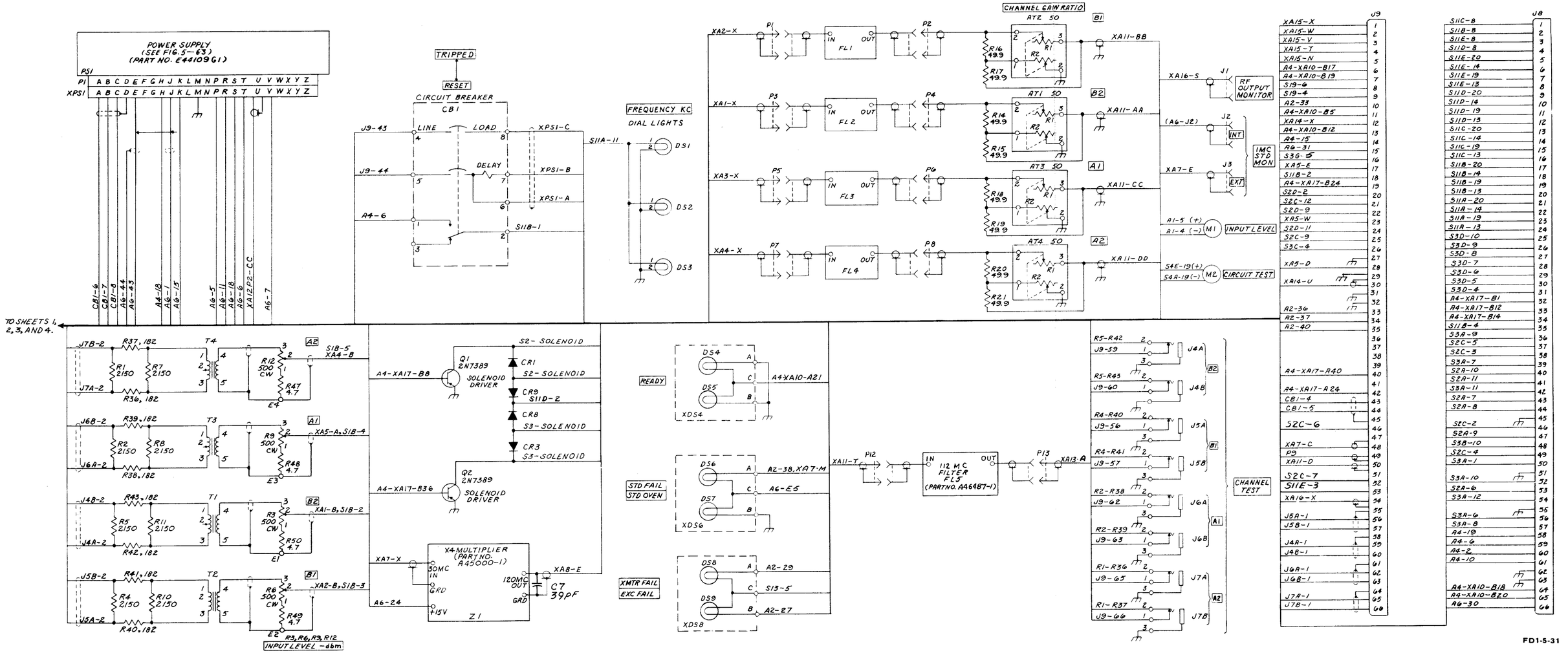


Figure 5-90. Modulator-Synthesizer MD-777/FRT, Front Panel and Chassis Assembly, Interconnection Diagram (Sheet 5 of 5)