TM 11-6625-2520-14

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS
(INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

SIGNAL GENERATOR AN/URM-170

This copy is a reprint which includes current pages from Change 1. Title was changed by Change 1 as shown above.

HEADQUARTERS, DEPARTMENT OF THE ARMY
12 JUNE 1972

WARNING

DANGEROUS VOLTAGES
EXIST IN THIS EQUIPMENT

Voltages in excess of 1550 Volts inside cabinet. Be careful when Signal Generator is removed from cabinet.

DON'T TAKE CHANCES!

TECHNICAL MANUAL
No. 11-6625-2520-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *12 June 1972*

Operator's, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools)

SIGNAL GENERATOR AN/URM-170

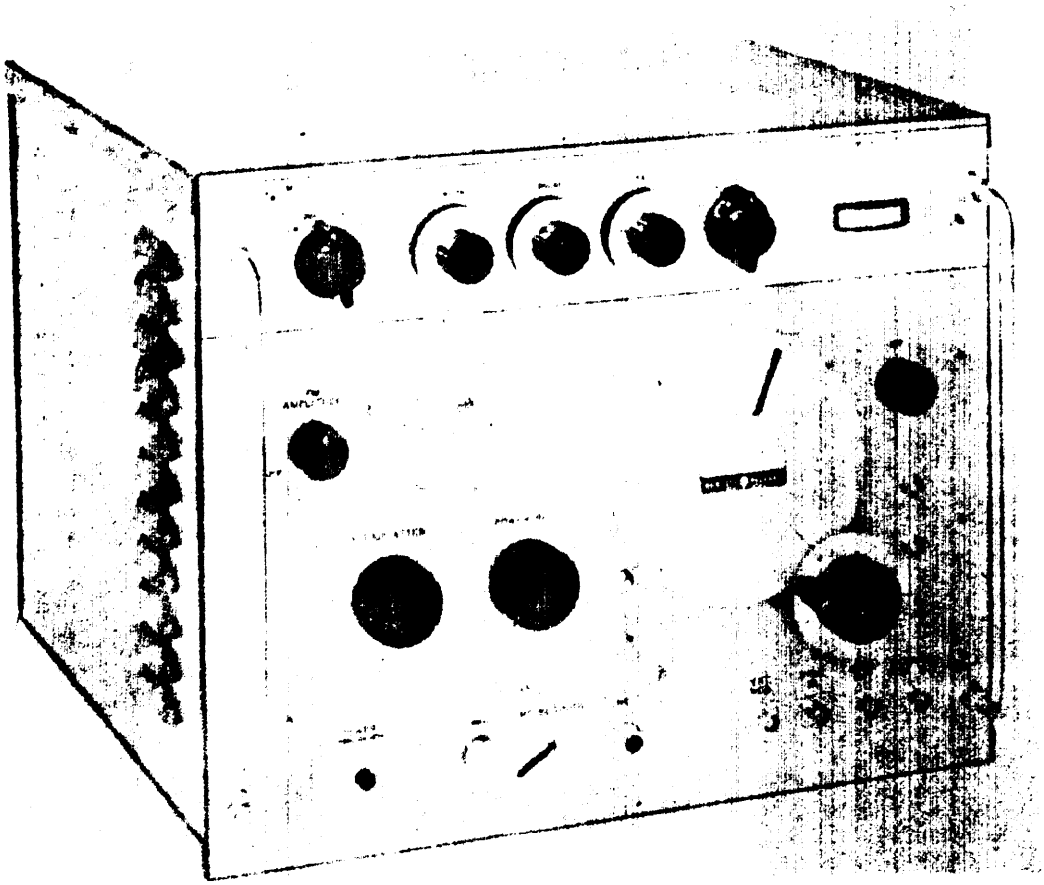


Figure 1-1. Model 618C/620B SHF Signal Generator.

CHAPTER A

INTRODUCTION

A.1 Scope

a. This manual describes Hewlett-Packard Models 618C/620B SHF Signal Generators, nomenclature Signal Generator AN/URM-170, and covers its installation, operation, and organizational, direct support, and general support maintenance.

b. Throughout this manual, where appropriate, references are made to other publications which contain information applicable to the operation and maintenance of the Models 618C/620B SHF Signal Generator. A complete listing of applicable reference publications and manual changes are provided in appendix A.

c. The maintenance allocation chart appears in appendix B.

d. The repair parts list appears in appendix C which is current as of 28 February 1974.

A.2 Indexes of Publications

a. DA PAM 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA PAM 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

NOTE

This technical manual is an authentication of the manufacturer's commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

A.3 Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58/NAVSUP PUB 378/AFR 71-4/MCO P4030.29, and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF S61). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33/AFM 75-18/MCO P4610.19A, and DSAR 4500.15.

A.4 Reporting of Equipment Manual Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-CT, Fort Monmouth, NJ 07703.

A.5 Administrative Storage

For procedure, forms and records, and inspection required during administrative storage of this equipment, refer to TM 740-90-1.

CHAPTER 1

GENERAL INFORMATION

1-1. DESCRIPTION.

1-2. The Hewlett-Packard Models 618C/620B SHF Signal Generators (Figure 1-1) provide RF signal output in the frequency ranges of 3,800 to 7,600 MHz, and 7,000 to 11,000 MHz respectively. At least 1-mW power output is available over the entire frequency range. The output frequency is indicated on a direct-reading dial. The RF output power is adjustable by an attenuator that is calibrated in μ V and dB.

1-3. Five types of modulation are available: internal pulse modulation, external pulse modulation, internal frequency modulation, external frequency modulation, and internal square-wave modulation.

1-4. The internal pulse modulation has a variable repetition rate of 40 to 4,000 Hz. Pulse width is variable from 0.5 to 10 μs as measured at the pulse 50% amplitude points. Internal square wave modulation is variable from 40 to 4,000 Hz.

1-5. The Signal Generator can be modulated by external pulses of positive or negative polarity. The amplitude of the modulating pulses may be 20 to 70 V, and the pulse width between 0.5 and 2,500 μs.

1-6. Internal frequency modulation comprises a sawtooth sweep rate of 40 to 4$00 Hz. Frequency deviation is approximately 5 MHz over most of the band. External frequency modulation from an external sine wave is provided. Maximum frequency deviation is 5 MHz.

1-7. Synchronization outputs of the Signal Generator comprise two types: delayed and undelayed. The delayed synchronization output is a positive pulse that occurs simultaneous with the RF pulse. The pulse has an amplitude of 25 V minimum and a rise time of less than 1 μs when terminated in a load of 1000 ohms or more. The undelayed synchronization pulse has the same characteristics as the delayed pulse, except the pulse occurs between 3 to 300 μs (as adjusted by front-panel control) before the RF pulse.

1-8. Both the pulse- and frequency-modulated RF output may be synchronized with the following externally generated signals: sine waves of 40 to 4,000 Hz and 5 to 50 V amplitude; pulses of 40 to 4,000 Hz, a peak amplitude of 5 to 50 V, a rise time of 0.1 to 1 μs, and a width of 0.5 to 5 μs.

1-9. INSTRUMENT IDENTIFICATION

1-10. Hewlett-Packard instruments have a two-part serial number. The first three digits are the serial prefix. If the prefix on your instrument is not listed on the title page of this manual, in the appendix, or on a Manual Change sheet enclosed with the manual, the correct information may be obtained from any Sales and Service Office listed at the rear of this manual.

Table 1-1. Specifications

Output

Frequency Range:
618C: 3,800 to 7,600 MHz covered in a single band.
620B: 7 to 11 GHz covered in a single band.
Repeller voltage automatically tracked and proper mode automatically selected

Calibration: Direct reading. Frequency calibration accuracy better than ±1%.

Vernier: Δ F control has a minimum range of 0.5 MHz (618C), 1.5 MHz (620B) over most of the band for fine tuning. Remote Δ F connector on rear panel permits fine tuning with external potentiometer; tuning range at least 0.5 MHz (618C), 1.5 MHz (620B) over most of the band with potentiometer ≥ 2 megohms.

Frequency Stability:
With Temperature: Less than 0.006%/°C change in ambient temperature.
With Line Voltage: Less than 0.02% change for line voltage variation of ±10%.
Residual FM: < 15 kHz peak.

Output Range: 1 milliwatt or 0.224 volt to 0.1 microvolt (0 dBm to -127 dBm) into 50 ohms. Directly calibrated in microvolt and dB. Coaxial Type N connector.

Output Accuracy: Within ±2 dB from -7 to -127 dBm, within ±3 dB from 0 to -7 dBm, at front panel connector, terminated in 50-ohm load. Temperature-compensated detector circuit monitors rf oscillator power level. An auxiliary, fixed-level rf output (at least 0.3 mW) is provided on the front panel for use with other equipment such as a frequency counter or phase-lock instrumentation.

Source Impedance: 50 ohms nominal; reflection coefficient less than 0.33 (2 swr, 9.6 dB return loss.)

Modulation

Modulation: Internal or external pulse, FM, and square wave.

Internal Pulse Modulation: Repetition rate variable from 40 to 4,000 pps, pulse width variable 1/2 to 10 microseconds.

Sync Out Signals: Simultaneous with rf pulse, positive; In advance of rf pulse, positive, variable 3 to 300 microseconds, (Better than 1 microsecond rise time and 25 to 100 volts amplitude into 1,000-ohm load.)

External Synchronization:
Sine Wave: 40 to 4,000 Hz, 5 to 50 V rms.
Pulse: 40 to 4,000 pps, 5 to 50 V peak, positive or negative, 0.5 to 5 μsec wide, 0.1 to 1 μsec rise time.

Internal Square Wave Modulation: Variable, 40 to 4,000 Hz, controlled by PULSE RATE control.

Internal Frequency Modulation: Sawtooth sweep rate adjustable 40 to 4, 000 Hz. Frequency deviation to 5 MHz peak-to-peak over most of the frequency range.

External Pulse Modulation: Pulse requirements: amplitude from 20 to 70 volts positive or negative, width 0.5 to 2,500μs.

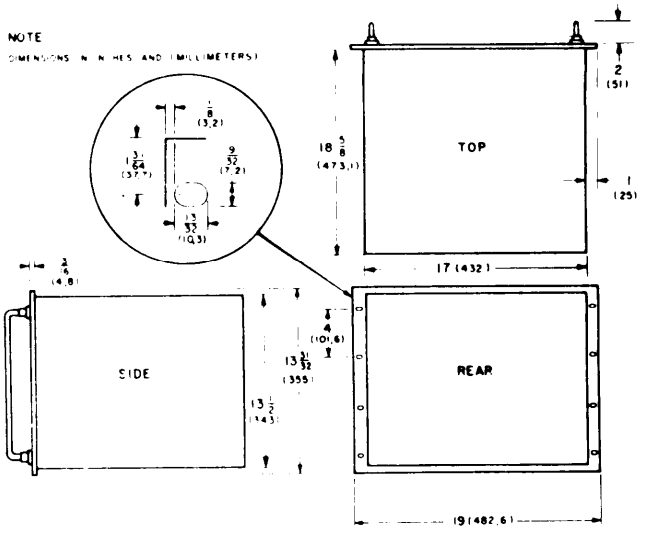
External FM: Frequency deviation approximately 5 MHz peak-to-peak over most of the band. Sensitivity approximately 20 V/MHz at front-panel connector, approximately 10 V/MHz at rear panel connector (mating connector supplied.) Front-panel connector is capacitively coupled to klystron repeller; rear-panel connector is dc coupled to klystron repeller and is suitable for phase-lock control input.

General

Power Source: 115 or 230 volts ±10%, 50 to 60 Hz, 230 W.

RFI: Conducted and radiated leakage limits are below those specified in MIL-I-6181D.

Dimensions: Cabinet Mount: 17-1/2 in. wide, 13-7/8 in. high, 20-3/8 in. deep behind panel (445 x 353 x 517 mm).
Rack Mount:



Weight: Net, 69 lbs. (31, 1 kg). Shipping, 90 lbs. (40, 5 kg).

Accessory Furnished: 11500A Cable Assembly, 6 feet (1830 mm) of specially treated RG-214A/U 50-ohm coaxial cable terminated at each end with UG-21D U Type N male connectors; 7-1/2-ft. (2290 mm) power cable.

Accessories Available: 11001A Cable Assembly, 45 in. long, RG-58C/U 50-ohm Coax, terminated by dual banana connector on one end, BNC on other. 10503A Cable Assembly, 4 feet long, RG-58C/U 50-ohm Coax, terminated on each end by BNC male connectors.

CHAPTER 2

INSTALLATION

2-1. INCOMING INSPECTION.

2.2. Inspect the Model 618C/620B for any damage incurred during transit. If the equipment has been damaged, report the damage on DD Form 6 (para 1-A.3). Check to see that the equipment is complete as listed on the packing slip. Report all discrepancies in accordance with TM 38-750.

2-3. PREPARATION FOR USE.

2-4. POWER REQUIREMENTS.

2-5. The Signal Generator requires a power source of 115 or 230 V ac ± 10%, single phase. The power source must supply approximately 250 W.

2-6. 115/230 VOLT OPERATION.

2-7. A two-position slide switch, on the rear panel, permits operation from either a 115 or 230 V power source. The number visible on the switch slider indicates the line voltage for which the Signal Generator is connected. The correct fuse rating for each line voltage is adjacent to the switch.

2-8. To prepare the Signal Generator for operation, set the 115-230 V switch so that the number visible on the slider corresponds to the available line voltage. Install a fuse of correct rating.

CAUTION

To avoid damage to the Signal Generator, before connecting the power cable, set the 115-230 V switch for the line voltage to be used.

2-9. POWER CABLE.

2-10. To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that the Signal Generator panel and cabinet be grounded. Accordingly, the Signal Generator is equipped with a three-conductor power cable which, when plugged into an appropriate receptacle, grounds the panel and cabinet. The offset pin of the three-prong connector is the ground pin.

2-11. To preserve the protection feature when operating the Signal Generator from a two-contact outlet. use a three-prong to two-prong adapter (hp Stock No. 12510048) and connect the green pigtail on the adapter to ground.

2-12. COOLING.

2-13. Forced air cooling is used to maintain safe operating temperatures within the Signal Generator cabinet. The air intake and exhaust ports, cooling fan, and air filter are located at the rear of the cabinet. To ensure adequate ventilation, maintain about three inches of clearance behind the cabinet.

CAUTION

Do not operate the Signal Generator if the fan is not operational.

2-14. AIR FILTER.

2-15. The air filter, as received with a new Signal Generator, has a coating of dust-catching substance which improves air cleaning action. To maintain adequate ventilation, clean and recoat the air filter at regular intervals. See Section V for cleaning instructions.

2-16. REPACKING FOR SHIPMENT.

2-17. If the Signal Generator is to be packaged for shipment use the original shipping container and packing materials. If these have been discarded or not in condition for reuse, obtain new materials from your local Hewlett-Packard Sales and Service Office (see rear of this manual for locations), or follow these general instructions:

a. Wrap the Signal Generator in heavy paper or plastic. (If the Signal Generator is being shipped to a Hewlett-Packard service facility, attach a tag indicating type of servicing required, return address, model number, and full serial number.)

b. Use a strong shipping container. A carton made of 500- to 600-pound test material will usually provide adequate protection.

c. Use enough shock-absorbing material (3- to 4-inch layer) around all sides of instrument to provide firm cushion and prevent movement inside the container. Protect the control panel with cardboard. With Hewlett-Packard "floater pack" packaging, the foam blocks provide sufficient shock protection, and additional material is unnecessary.

d. Seal the shipping container securely.

e. Mark the shipping container "FRAGILE" to assure careful handling.

2-18. In any correspondence refer to the Signal Generator by model number and full serial number.

CHAPTER 3

OPERATION

3-1. INTRODUCTION.

3-2. This section provides instruction to properly operate the Signal Generator. Included are general operating information; a description of controls, connectors, and indicators; and basic operating procedures for each mode of operation.

3-3. GENERAL OPERATING INFORMATION.

CAUTION

Do not connect RF or dc power in any magnitude to the output terminals of this instrument. As little as 0.2 W can permanently damage the attenuator probe. Extreme care should be exercised when working with transceiver-type equipment to insure that the transmitter section is not operating while the Model 618C/620B is connected to the transceiver antenna.

3-4. OUTPUT ACCURACY. The accuracy of the output system and the calibration of the attenuator in the Model 618C/620B is determined at the front-panel output jack. Output cable losses must be considered in addition to the attenuator dial indication when employing specific signal levels at the end of the output cable.

3-5. Erratic instrument performance at the output terminals, or no power output is frequently an indication that the instrument has been subjected to abuse. This condition may be confirmed by measuring either the dc resistance of the attenuator or the SWR looking into the panel connector. Dc resistance is approximately 50 ohms. SWR (at panel connector) is 2.0 or less.

3-6. The klystron used in this instrument is expensive and has a shorter life (approximately 1000 hours) than that of a conventional vacuum tube. Power should be removed from the Signal Generator when it is not in use in order to increase the useful life of the klystron.

3-7. CONTROLS, CONNECTORS AND INDICATORS.

3-8. Front-panel controls, connectors, and indicators are shown and described in Figure 3-1.

3-9. BASIC OPERATING PROCEDURES.

3-10. TURN ON.

a. Set rear-panel 115-230 V switch to match line voltage, and check that the line fuse has correct rating. (Correct fuse rating is directly above the visible number on the switch slider.)

b. Connect Signal Generator to power source.

c. Depress POWER switch. Allow 5-minute warmup time. If ambient temperature is below 10ºC (50°F), allow a longer warmup period.

3-11. DETAILED OPERATING PROCEDURES.

CAUTION

Do not use the Signal Generator if the cooling fan does not operate at turn-on.

3-12. Detailed operating procedures are given in Figures 3-2 through 3-7.

3-13. OPERATION WITH THE DYMEC DY-2650A OSCILLATOR SYNCHRONIZER.

The 618C/620B is easily adapted for use with the DY-2650A Synchronizer as follows:

1. Remove the internal shorting jumper from J303, pins A & B.
   The jumper is connected between the klystron reflector and its power supply across R526.
2. Connect the mating connector J7 to P2 on the DY-2650A. This is to protect a user from accidentally contacting the otherwise exposed pins of P2, one of which will be at the reflector potential after completion of step 3.
3. Connect the klystron reflector lead and the reflector voltage lead to pins G and F, respectively, of J5 on the DY-2650A. An RG-59A/U type cable is recommended for this connection.

No other modifications are normally required. The RF sample for the DY-2650A must be obtained from the signal generator output connector through a suitable coupler. Varying the output level from the signal generator to the device being tested will also vary the RF sample level into the DY-2650A. It is therefore necessary to set the RF output level from the signal generator to a fixed value and to use an external attenuator for varying the level to the device under test if wide ranges in level are required.

CAUTION

When the shorting jumper has been removed from the klystron reflector supply voltage as described in step 1 above, the 620B must not be operated without being connected to the DY-2650A unless the reflector lead jumper is replaced. Omission of the jumper will damage the klystron.

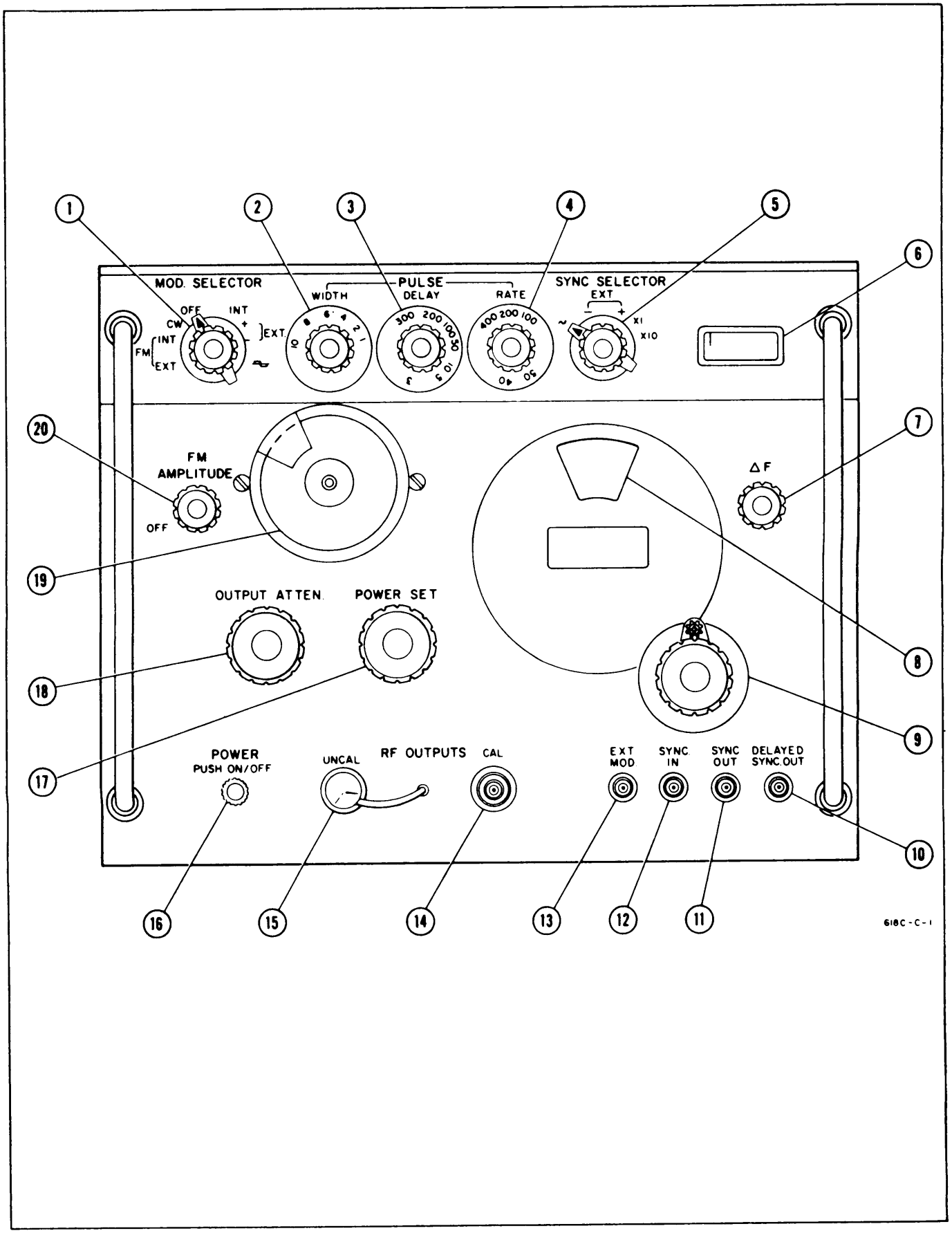
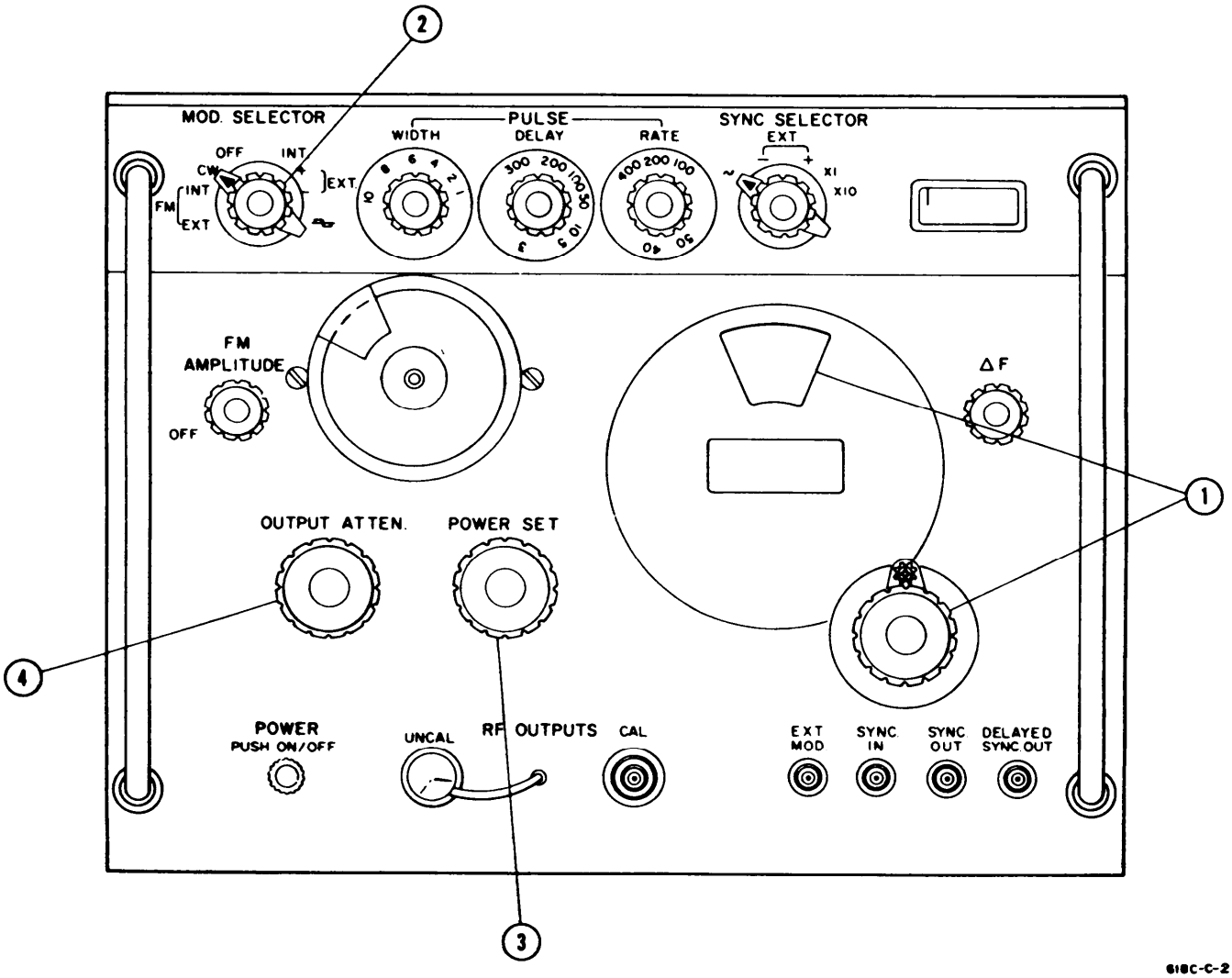


Figure 3-1. Front-panel Controls, Connectors, and Indicators (Part 1 of 2).

1. MOD. SELECTOR. In FM EXT position, sine wave or sawtooth applied to EXT. MOD connector modulates Signal Generator. In FM INT position, an internally generated sawtooth modulates the Signal Generator. In CW position, the Signal Generator is not modulated. In OFF position, Signal Generator RF output is disabled. In INT. position, the Signal Generator is modulated by internally generated pulses. In EXT+ position, the Signal Generator can be modulated by positive pulses applied to the EXT. MOD. connector. In EXT- position, the Signal Generator can be modulated by negative pulses applied to the EXT. MOD. connector. In ⊓⊔ position Signal Generator is modulated by internally generated square waves (approximately 50% duty cycle).
2. PULSE WIDTH. Adjusts width of modulating pulse when MOD. SELECTOR is set to INT.
3. PULSE DELAY. Adjusts the delay time between synchronizing pulse and RF output pulse from 3 to 300 µs.
4. PULSE RATE. Adjusts pulse repetition rate of modulation when MOD SELECTOR is set to INT. FM INT, or ⊓⊔ position and SYNC SELECTOR is in X1 or X10 position. When SYNC SELECTOR is in X1 position, pulse rate is indicated by PULSE RATE control; when SYNC SELECTOR is in X10 position, pulse rate is 10 times that indicated by PULSE RATE control.
5. SYNC SELECTOR. In ~ position, and when MOD. SELECTOR is set to INT, Signal Generator may be synchronized by external sine-wave signal of 5-50 V rms applied to SYNC. IN connector. In EXT- position, and when MOD. SELECTOR is in INT position, Signal Generator must be synchronized by negative pulses (5-50 V peak-to-peak) applied to SYNC. IN connector. In EXT+ position, and when MOD. SELECTOR is set to INT, the Signal Generator must be synchronized by external positive pulses (5-50 V peak-to-peak) applied to the SYNC. IN connector. In X1 position, and MOD. SELECTOR is set to INT, the modulation repetition rate is as indicated by the PULSE RATE control. In the X10 position, and when MOD. SELECTOR is set for INT, the modulation repetition rate is 10 times that indicated by the PULSE RATE control.
6. Power Meter. Indicates RF power input in dBm to attenuator.
7. Δ F. Provides up to 0.5 MHz adjustment of output frequency for 618C; 1.5 MHz for 620B.
8. MHz/GHz. Indicates RF output frequency in megahertz/gigahertz for 618C/620B respectively.
9. Frequency Control. Adjusts RF output frequency.
10. DELAYED SYNC. OUT. Delayed (3-300 µs) synchronization signal is available at this connector.
11. SYNC. OUT. Undelayed synchronization output signal is available at this connector.
12. SYNC. IN. External synchronization signal is applied to this connector.
13. EXT. MOD. External modulation signal is applied to his connector.
14. RF OUTPUTS CAL. Source of calibrated RF power is available at this connector.
15. RF OUTPUTS UNCAL. Uncalibrated RF output power is available at this connector.
16. POWER. Turns Signal Generator on and off.
17. POWER SET. Adjusts RF power input to attenuator.
18. OUTPUT ATTEN. Adjusts RF output power to a calibrated level.
19. Attenuator Dial. Indicates RF output level when power meter is indicating 0 dBm.
20. FM AMPLITUDE. Adjusts frequency deviation of RF when using frequency modulation.

Figure 3-1. Front-Panel Controls, Connectors, and Indicators (Part 2 of 2).



Note

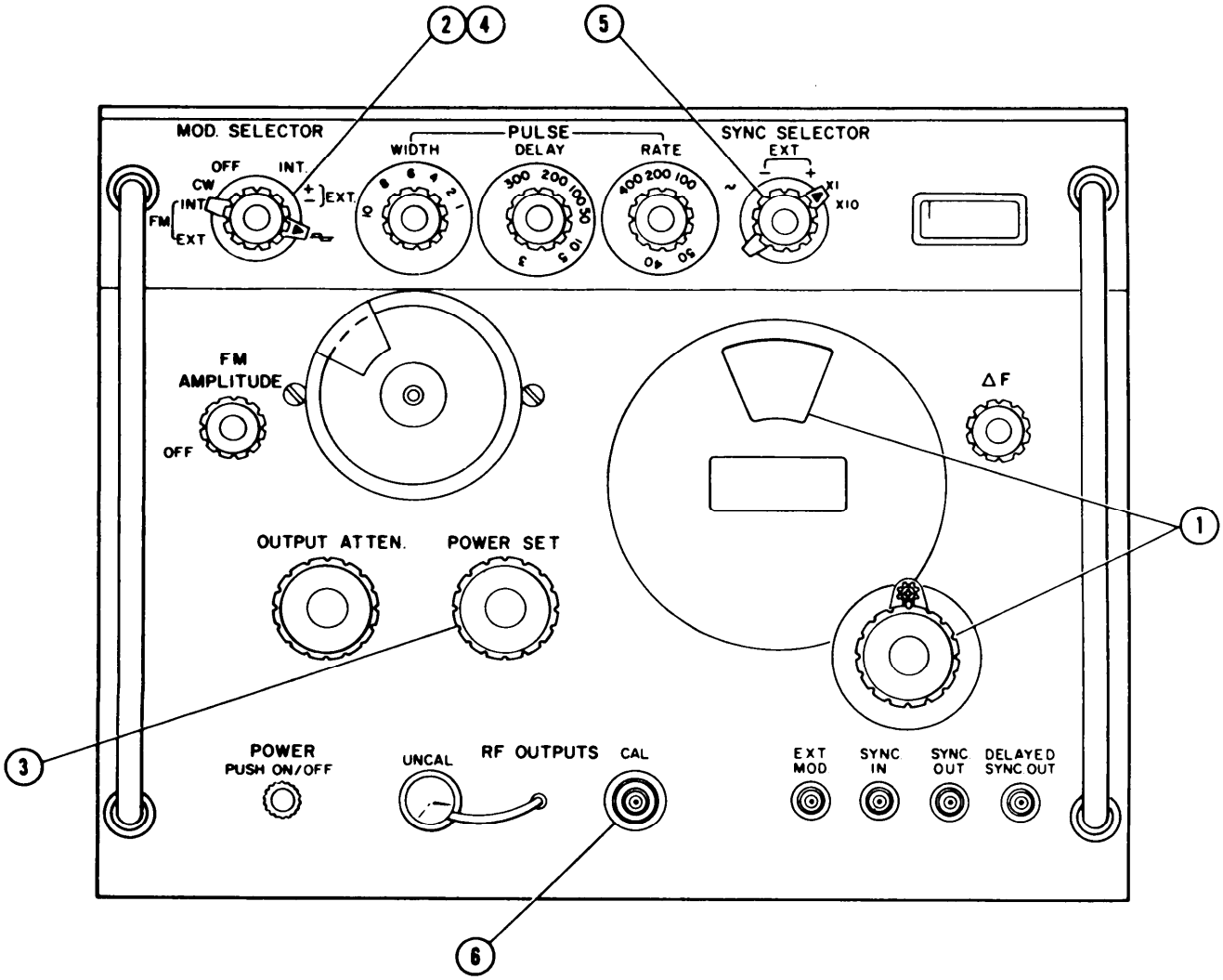
Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial. Δ F is vernier turning which can be adjusted by the knob on the front panel or by varying a potentiometer connected to the Δ F connector on the rear (see specifications).
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Adjust OUTPUT ATTEN. for desired output level as indicated by attenuator dial.

Note

Δ F control should be centered when not in use.

Figure 3-2. CW Operation.



Note

Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial.
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Set MOD. SELECTOR TO ⊓⊔.
5. Set SYNC SELECTOR TO X1 or X10 and adjust PULSE RATE control for desired square-wave frequency.
6. Connect RF cable between RF OUTPUTS CAL. connector and equipment being tested.

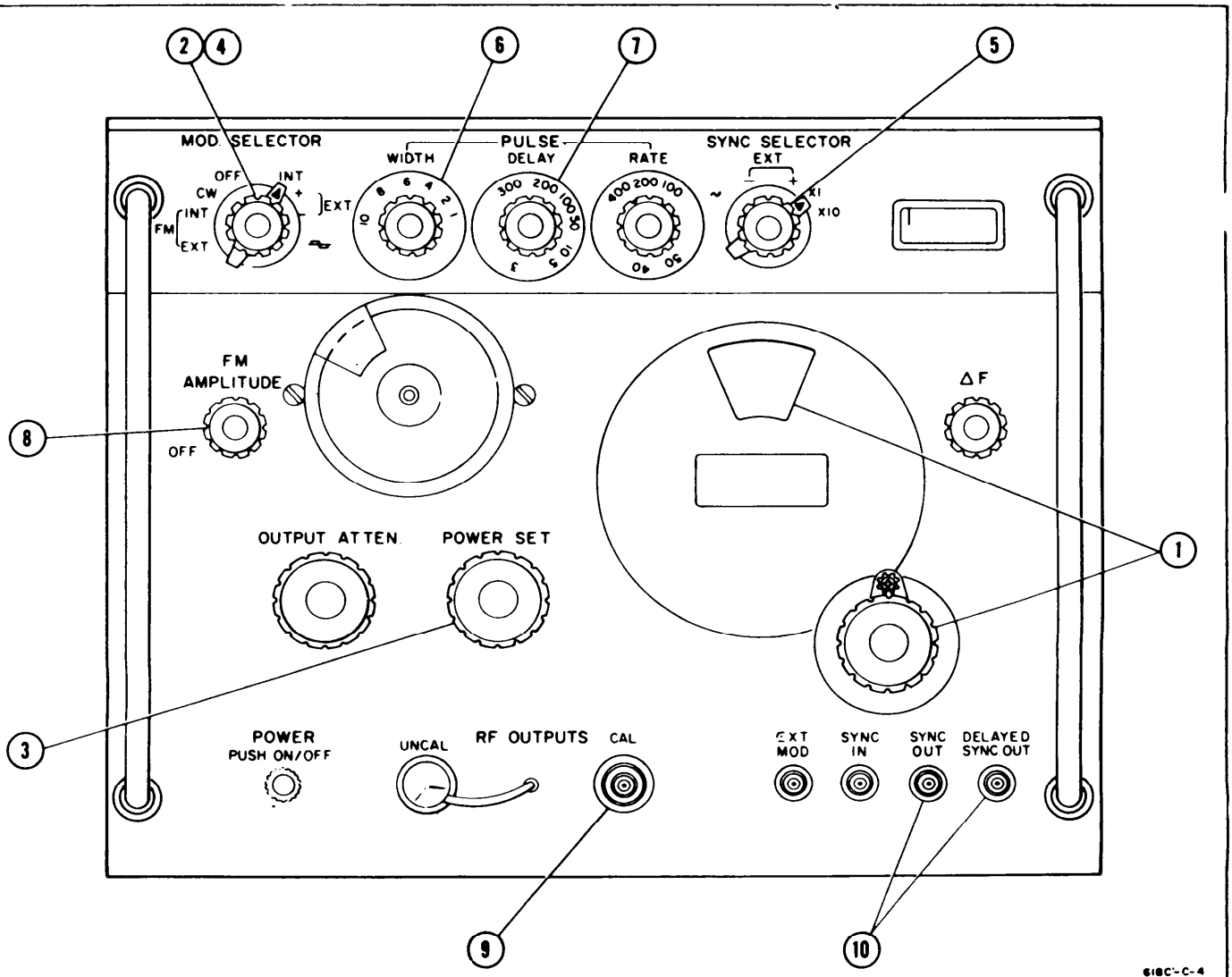
Note

Synchronization pulses occurring at the modulation rate are available at the SYNC. OUT connector.

Note

Δ F control should be centered when not in use.

Figure 3-3. Internal Square-Wave Modulation Operation.



Note

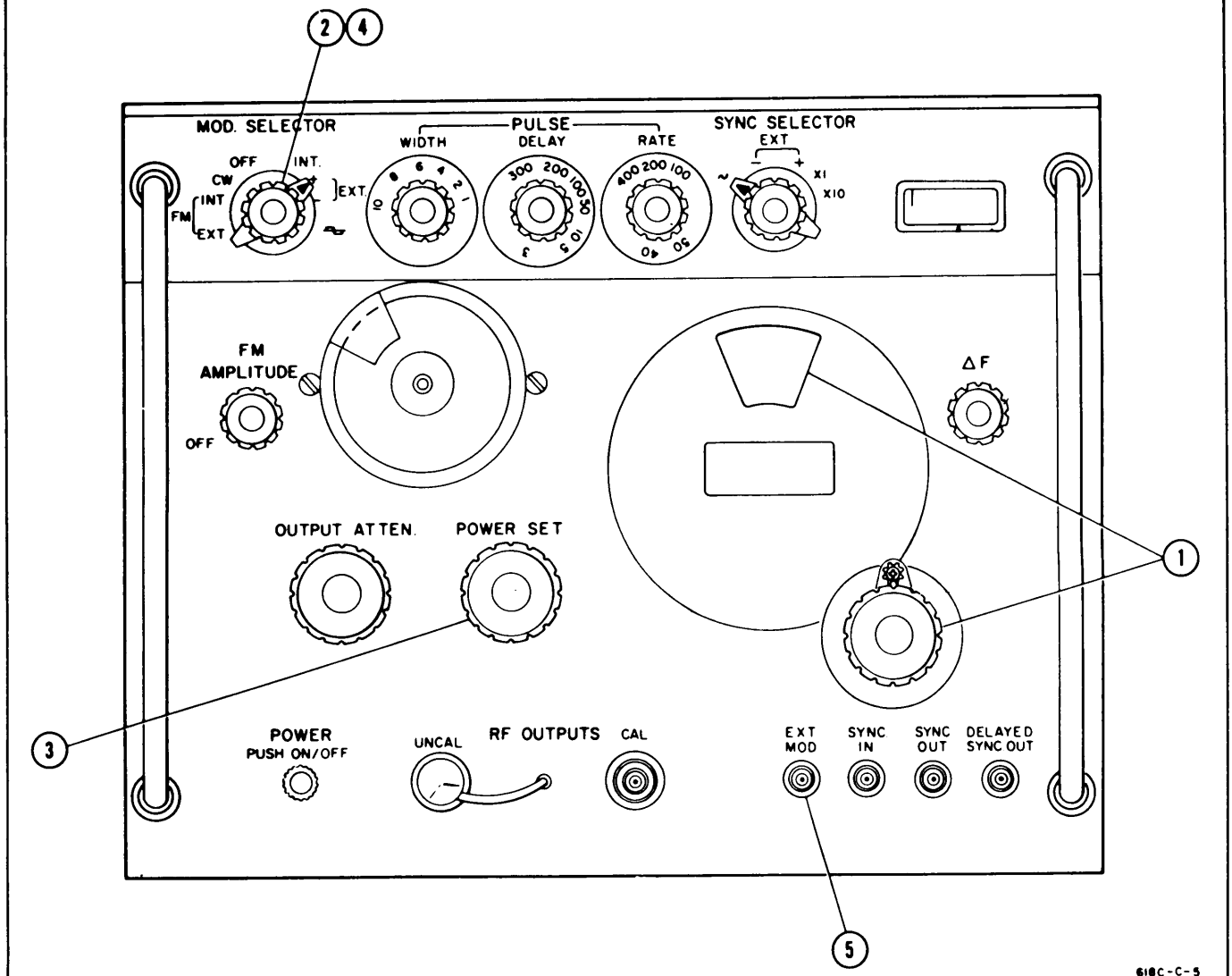
Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial.
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Set MOD. SELECTOR to INT.
5. Set SYNC SELECTOR to X1 or X10, and adjust PULSE RATE control for desired pulse repetition rate.
6. Adjust PULSE WIDTH control for desired modulation pulse width.
7. Adjust PULSE DELAY control for desired delay time.
8. Set FM AMPLITUDE control to OFF.
9. Connect RF cable between RF OUTPUTS CAL connector and equipment being tested.
10. Connect pulse cable between the SYNC OUT and/or DELAYED SYNC OUT connectors and external equipment as required by the application.

Note

Δ F control should be centered to obtain optimum pulse rise and decay.

Figure 3-4. Internal Pulse Modulation Operation.



Note

Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial.
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Set MOD. SELECTOR to EXT or EXT-, as required by the polarity of the external modulating pulses.
5. Connect external modulating source to EXT. MOD. connector. External modulating pulses must have peak-to-peak amplitude of between 5 to 50 v.

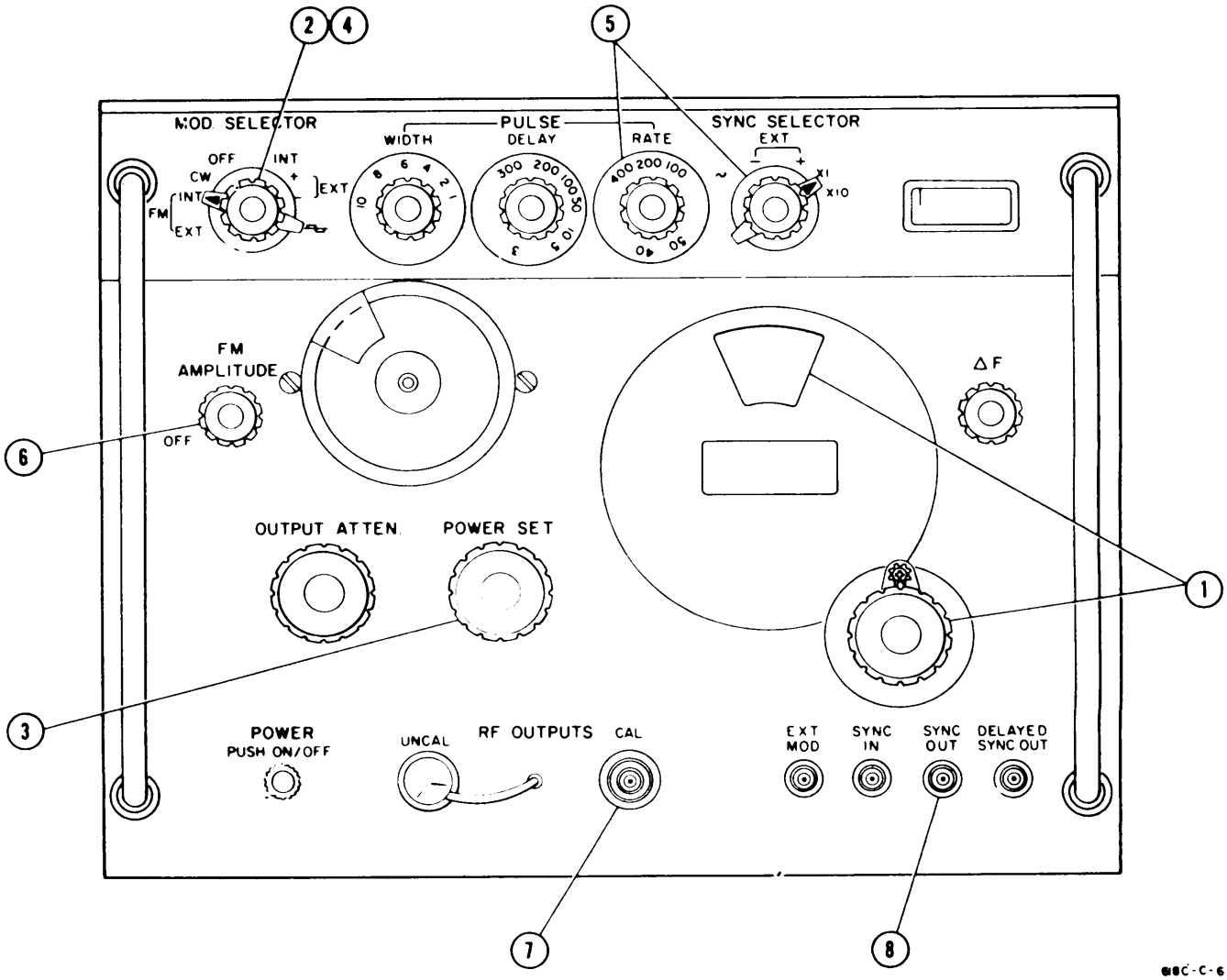
Note

In this mode of operation, no synchronization pulses are available at the DELAYED SYNC. OUT or SYNC. OUT connector.

Note

Δ F control should be centered to obtain optimum pulse rise and decay.

Figure 3-5. External Pulse Modulation Operation.



Note

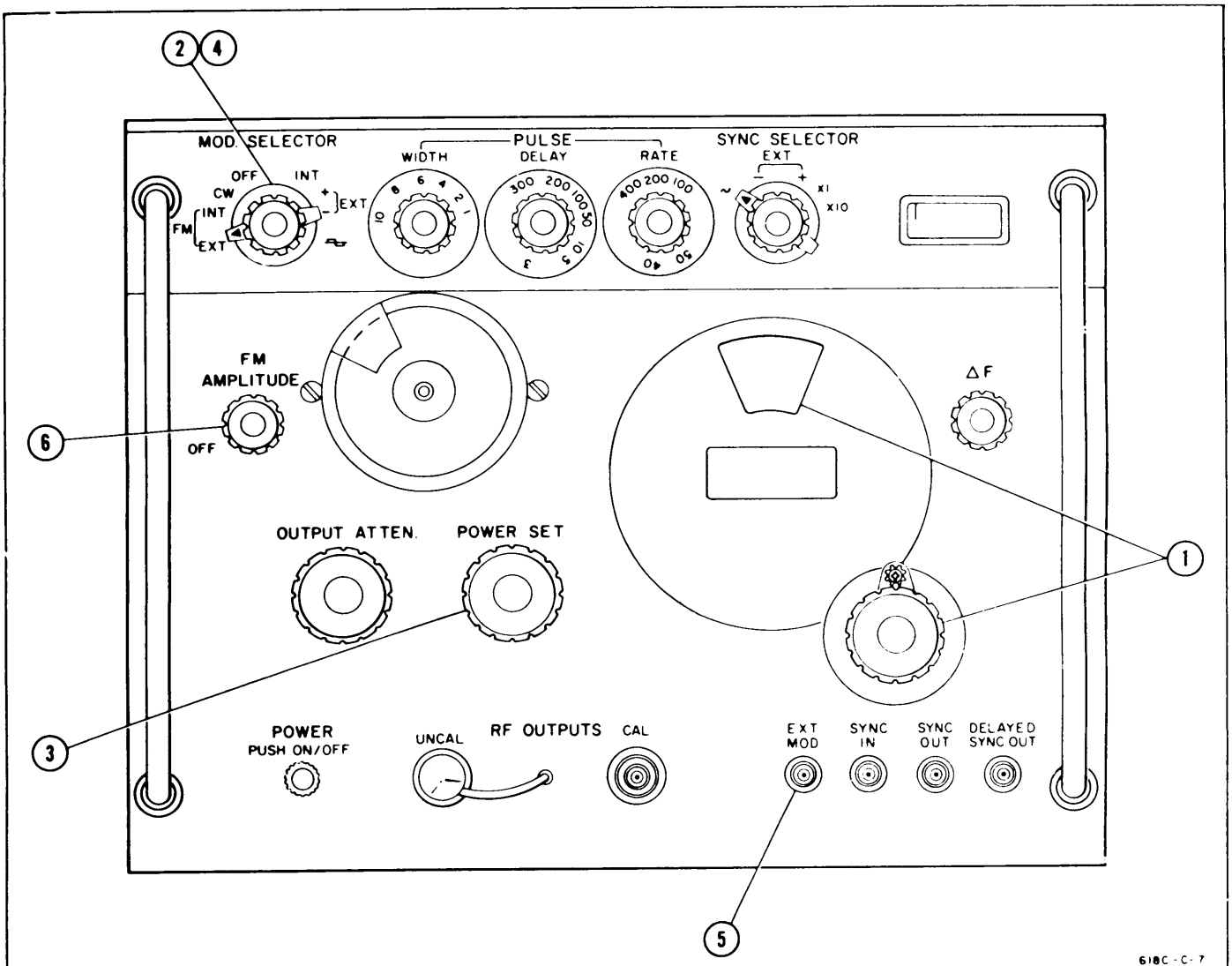
Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial.
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Set MOD. SELECTOR to FM INT.
5. Set SYNC SELECTOR to X1 or X10 and adjust PULSE RATE control for desired modulation frequency.
6. Set FM AMPLITUDE to OFF, and then carefully turn the control clockwise until the desired degree of frequency deviation is obtained. Because of klystron characteristics, unstable operation will occur when the control has been advanced to the point where the fm deviation is greater than the stable portion of the mode.
7. Connect RF cable between RF OUTPUTS CAL connector and equipment under test.
8. If desired, connect pulse cable between SYNC. OUT. CONNECTOR and external equipment.

Note

Δ F control should be centered to allow the klystron to operate in the center of the mode.

Figure 3-6. Internal Frequency Modulation Operation.



Note

Perform turn-on procedure described in paragraph 3-10.

1. Adjust frequency control for desired RF output frequency as indicated on dial.
2. Set MOD. SELECTOR to CW.
3. Adjust POWER SET for 0-dBm indication on power meter.
4. Set MOD SELECTOR to FM EXT.
5. Connect external modulation voltage to the EXT. MOD. connector. The modulation signal should have a level of at least 70 V rms.
6. Set FM AMPLITUDE to OFF, and then carefully turn the control clockwise until the desired degree of frequency deviation is obtained. Because of klystron characteristics, unstable operation will occur when the control has been advanced to the point where the fm deviation is greater than the stable portion of the mode.

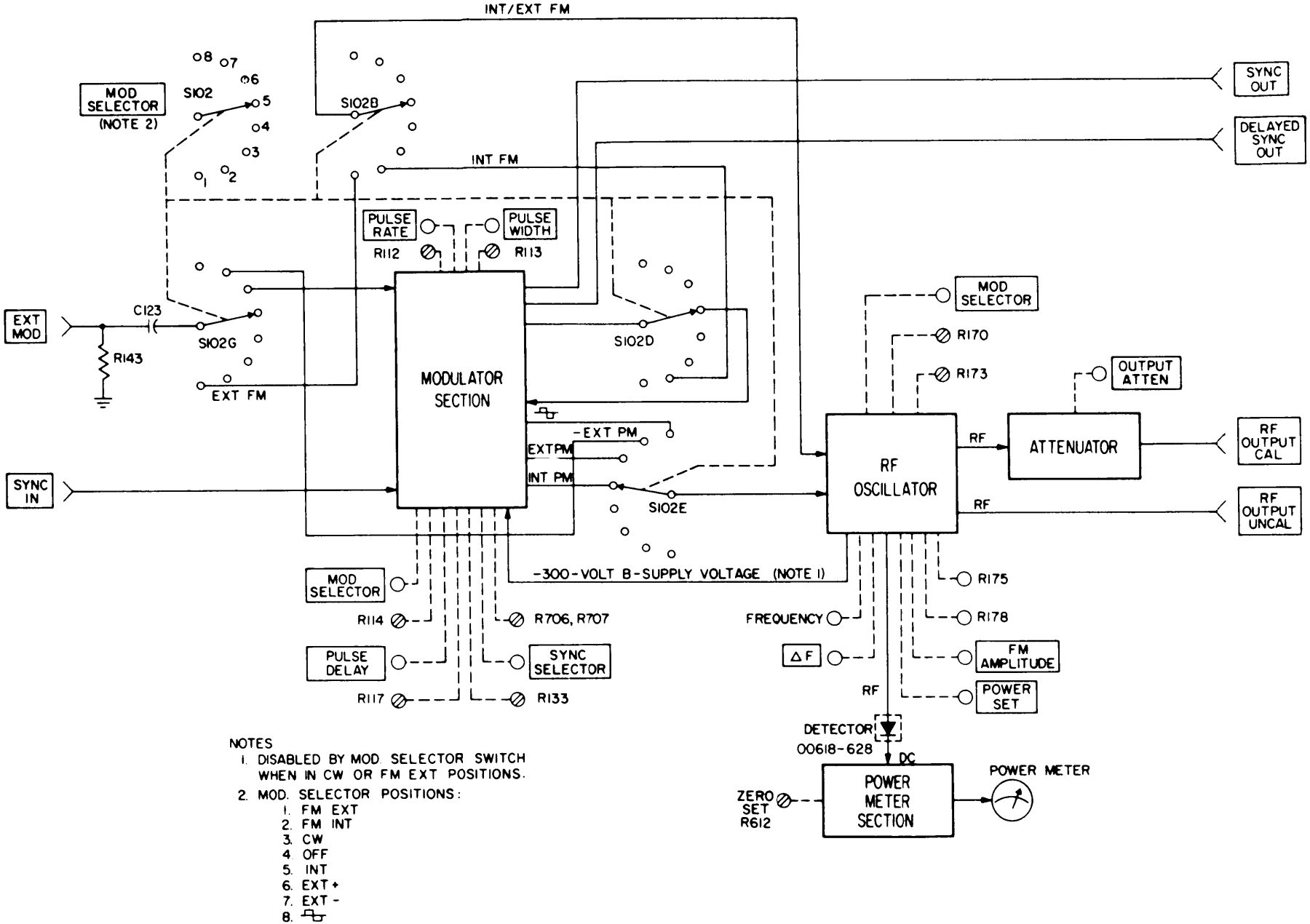
Note

In this mode of operation, no synchronization pulses are available at the DELAYED SYNC. OUT or SYNC. OUT connector.

Note

Δ F control should be centered to allow the klystron to operate in the center of the mode.

Figure 3-7. External Frequency Modulation Operation.



NOTES
1. DISABLED BY MOD. SELECTOR SWITCH WHEN IN CW OR FM EXT POSITIONS.
2. MOD. SELECTOR POSITIONS:
   1. FM EXT
   2. FM INT
   3. CW
   4. OFF
   5. INT
   6. EXT +
   7. EXT -
   8. ⊓

Figure 4-1. Simplified Block Diagram.

CHAPTER 4

PRINCIPLES OF OPERATION

4-1. INTRODUCTION.

4-2. This section contains explanations of the operation of the Signal Generator circuits. Figure 4-1 is a simplified block diagram showing principal circuit sections and operating controls. Each circuit section and important individual circuits are explained in succeeding paragraphs.

4-3. THE MODULATOR SECTION.

4-4. The Modulator Section is shown in block diagram form in Figure 4-2. The function of the circuits in this section is to establish a modulating pulse (for pulse operation) or a sawtooth voltage (for frequency modulation) and to apply it to the RF oscillator to obtain the desired type of RF output. Various portions of these circuits are not employed in certain types of operation, such as external pulse or external FM operation (see figure 4-1). However, the block diagram shows the condition (delayed pulse output with external synchronization where all of the circuits are employed, and the description will cover this type of operation. Other types of operation will be described in later paragraphs.

4-5. SYNCHRONIZING CIRCUITS. These circuits accept the external synchronizing voltage applied at the SYNC IN connector, and transform it into a negative pulse to trigger Pulse Rate Multivibrator V103. The circuit elements are shown in Figure 4-3. The grid of V101A is returned to B+ (ground). This places the grid at zero bias and the tube is conducting through plate load resistor R103. The tube responds to both positive and negative signals.

4-6. The negative-going portion of a sine-wave synchronizing voltage, or a negative synchronization pulse, causes the tube to cut off, developing a positive pulse in its plate circuit. This pulse is applied to the grid of V101B. Tube V101B is cut off (bias of -15 V) and the positive pulse from the plate of V101A causes V101B to conduct; thus, its plate voltage drops and the output is a negative-going pulse with a steep leading edge.

4-7. This negative pulse is applied to the ~ and (-) contacts of SYNC SELECTOR switch S101A through Series Clipper V102A. Clipper V102A develops only negative pulses at its output.

4-8. When a positive external synchronization pulse is applied to the grid of V101A, a negative pulse is developed in its plate circuit and applied through capacitor C103 to the + contact of S101A.

4-9. PULSE RATE MULTIVIBRATOR, SYNC CONDITION. When external sine-wave synchronization signals are employed, the Synchronization Multivibrator is switched to the operating condition shown in figure 4-4. This circuit is a one-shot multivibrator with V103A drawing current while V103B is cut off. The negative pulse from the synchronization input circuits causes the multivibrator to switch at t_1, developing a negative pulse in the plate circuit of V103B. The width of the pulse is determined by the length of time required to discharge capacitor C111 through resistor R115.

4-10. PULSE RATE MULTIVIBRATOR, FREE-RUNNING CONDITION. In the FM INT, INT (pulse), and ⊓⊔ positions of MOD. SELECTOR switch S102, the Pulse Rate Multivibrator is converted to a free-running multivibrator (figure 4-5). Under this condition the synchronization input circuits are disconnected from the multivibrator.

4-11. The time constants of the multivibrator are balanced so that the circuit generates a wave that is essentially square with approxmately a 50% duty cycle; however, this may vary depending upon the repetition rate. This arrangement is used so that internal square-wave as well as internal pulse modulation of the RF Oscillator can be obtained. The arrangement also provides for equally spaced pulses to trigger the Sawtooth Generator when internal FM modulation is being used.

4-12. PULSE SHAPER. The Pulse Shaper (figure 4-6) is a One-Shot Multivibrator with a 2-µs pulse duration. It consists of V104A and V104B, two halves of type 5814A dual triode. In the steady-state condition, V104A is conducting because its grid is returned to the cathode by resistor R121. Tube V104B is cut off as its grid is returned to -300 V, thus placing a bias on the grid (developed by the current through V104A and cathode resistor R120).

4-13. When this multivibrator is triggered by the negative-going leading edge of the waveform generated by the Pulse Multivibrator, a positive 2-µs pulse appears at the plate of V104A.

4-14. The positive output pulse is applied to the Synchronization Amplifier tube, V105A, shown in Figure 4-7, and to Synchronization Cathode Follower V105B, shown in Figure 4-6.

4-15. SYNCHRONIZATION CATHODE FOLLOWER. This stage provides the undelayed synchroniztion output signal for synchronizing external equipment. It is comprised of V105B, one half of a type 5814 dual-triode tube. The output is taken across R129, the cathode resistor, and is capacitively coupled through C118 to the SYNC. OUT connector. Resistor R130 is returned from the center conductor of the connector to ground, so that the line is terminated in reference to ground instead of the 300-V potential existing at the base of the cathode resistor.

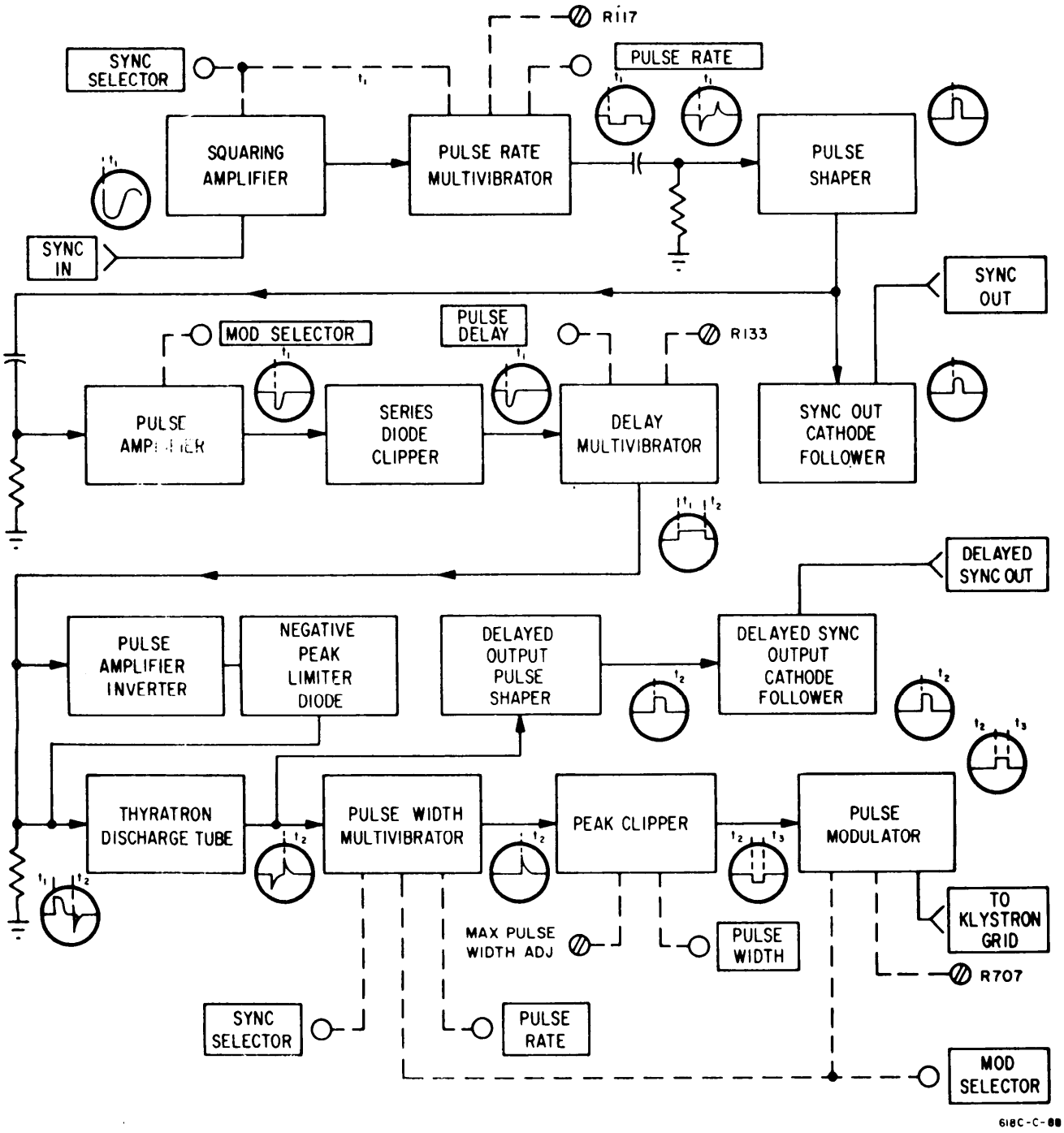


Figure 4-2. Modulator Section Block Diagram.

4-16. The output of the Cathode Follower is a positive pulse greater than 25V peak-to-peak when applied to a load having a resistance of from 1,000 to 100,000 ohms and a shunt capacitance of 500 pF.

4-17. PULSE AMPLIFIER. The Pulse Amplifier is comprised of V105A, one-half of a type 12AU7 tube (Figure 4-7), and its associated components. It amplifies and inverts the 2 µs pulse provided by the Pulse Shaper and provides a positive pulse (in its cathode circuit) that is employed to trigger the Sawtooth Generator when internal frequency modulation is employed. Capacitor C115 acts as a cathode bypass capacitor when internal pulse modulation is used.

4-18. SERIES LIMITER. The negative pulse from the plate of the Pulse Amplifier is applied to the cathode of diode limiter V106A (Figure 4-7). This limiter is so connected that only the negative components with an amplitude greater than the diode bias are applied to the cathode of the Delay Multivibrator. This prevents triggering the multivibrator by any positive or low-amplitude negative transients that may appear on the output of V105A in addition to the desired trigger pulse.

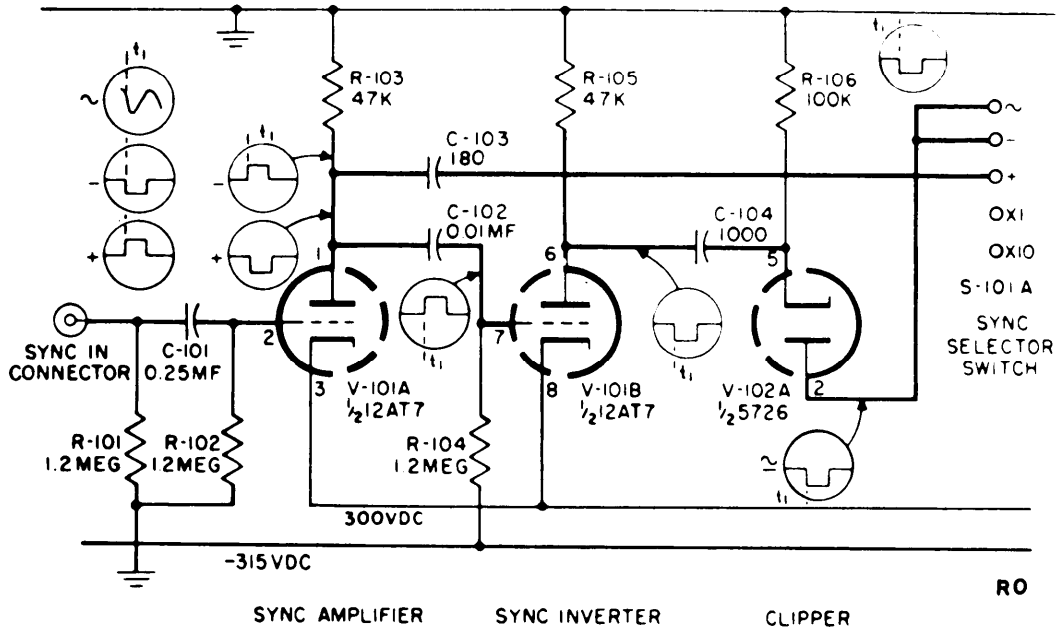


Figure 4-3. Schematic Diagram of Synchronizing Circuits.

4-19. DELAY MULTIVIBRATOR. This circuit (Figure 4-7) provides an adjustable time delay in applying the modulation to the RF Oscillator. It consists of a type 12AU7 dual triode, V107, connected as a one-shot multivibrator with an adjustable resistor R136, the PULSE DELAY control.

4-20. The Delay Multivibrator starts its cycle when a negative pulse drives the cathode of V107A in a negative direction. This is equivalent to placing a positive signal on the grid, and the tube conducts. A negative wave-front appears at the plate of V107A and (through capacitor C120) drives the grid of V107B in a negative direction, cutting off this half of the stage. The length of time the circuit requires to return to its resting condition is determined by the time constant of C120, R136 and R137. Potentiometer R136 is the PULSE DELAY control that adjusts the delay from 3 to 300 µs while Potentiometer R133 is an adjustment used to set the maximum delay to 300 µs.

4-21. In the steady-state condition V107A is cut off while V107B is conducting through plate load resistors R138, R139 and R140, in parallel with resistor R142 and diode V106B.

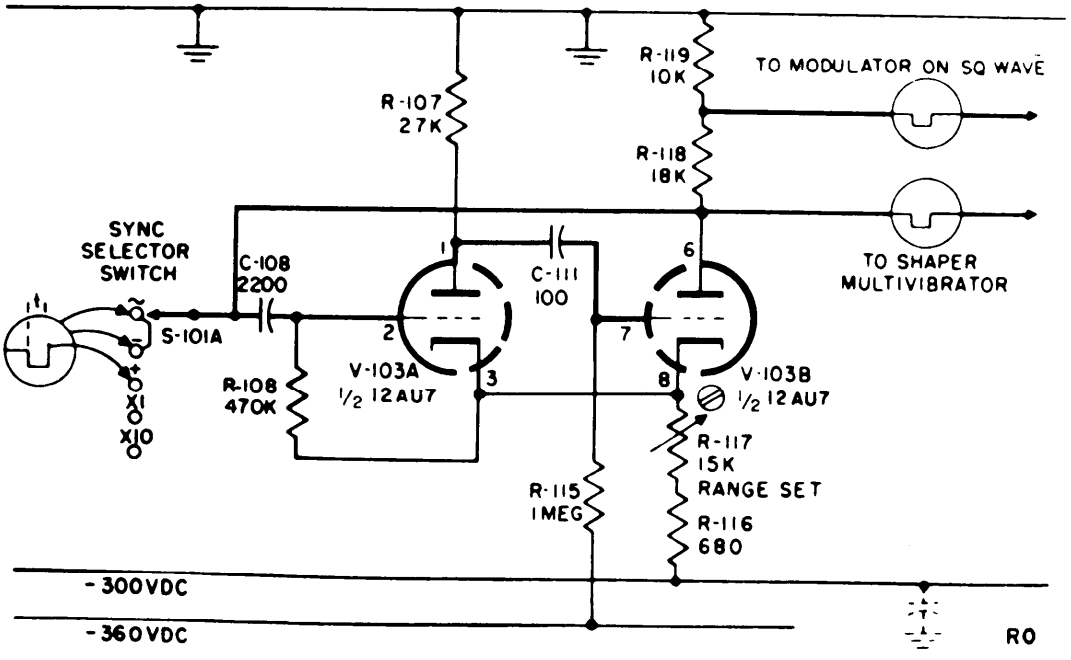


Figure 4-4. Schematic of Pulse-Rate Multivibrator, Synchronized Condition.

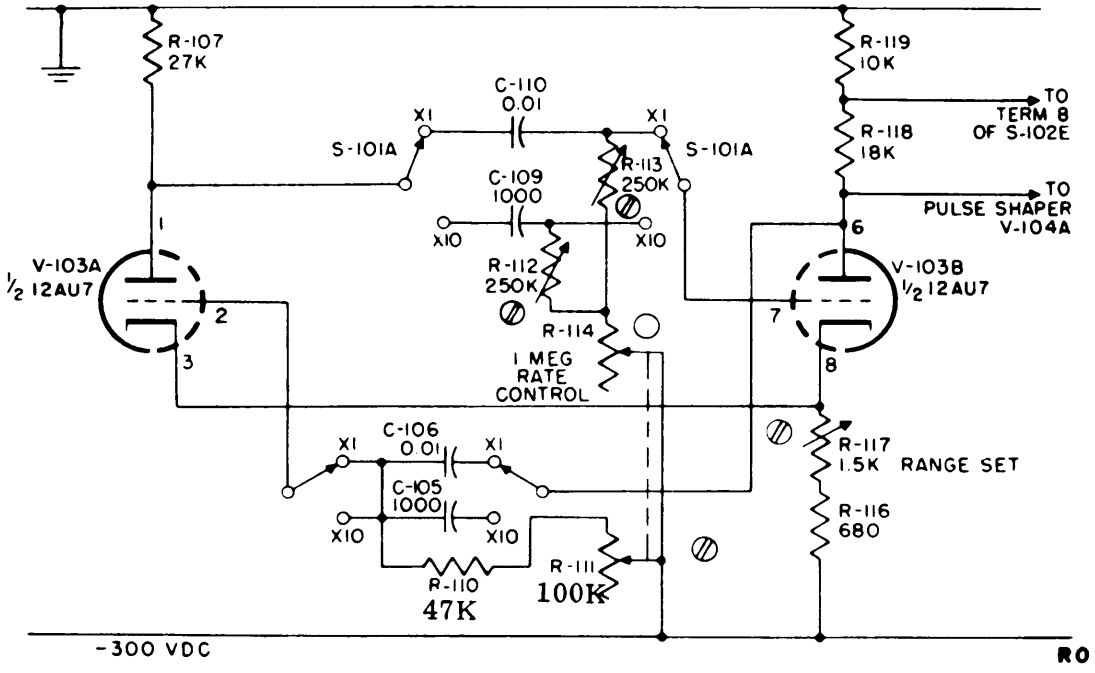


Figure 4-5. Schematic of Pulse-Rate Multivibrator Free-Running Condition.

4-22. Tube V106B serves as a negative base limiter to eliminate low-amplitude negative pulses that may otherwise follow the trailing edge of the main pulse from V107B.

4-23. PULSE AMPLIFIER INVERTER. This stage (Figure 4-8) is comprised of V109A, one-half of a type 12AU7 dual triode. The positive pulse from the Pulse Delay Multivibrator is differentiated by capacitor C122 and resistor R187 to form a sharp negative spike at t_2. These spike pulses are amplified and inverted in the plate circuit of V109A.

4-24. BLOCKING DIODE. The output of V109A is applied to the grid of Thyratron Discharge tube V110 through blocking diode V108B. Tube V108B serves to pass the positive output spike at t_2 and to inhibit the negative spike at t_1. At short delay times, this insures positive triggering of Thyratron V110.

4-25. THYRATRON DISCHARGE TUBE. This stage consists of the type 2D21 thyratron tube, V110, shown in Figure 4-8. Its grid is returned to approximately -315 V while the cathode is returned to -300 V, cutting off the tube. Capacitor C127 is charged to approximately 110 V positive with respect to the cathode, a point established by the values of resistors R148, R149, and Diode V108A. This limiting of the voltage on capacitor C127 is necessary due to wide variation in the

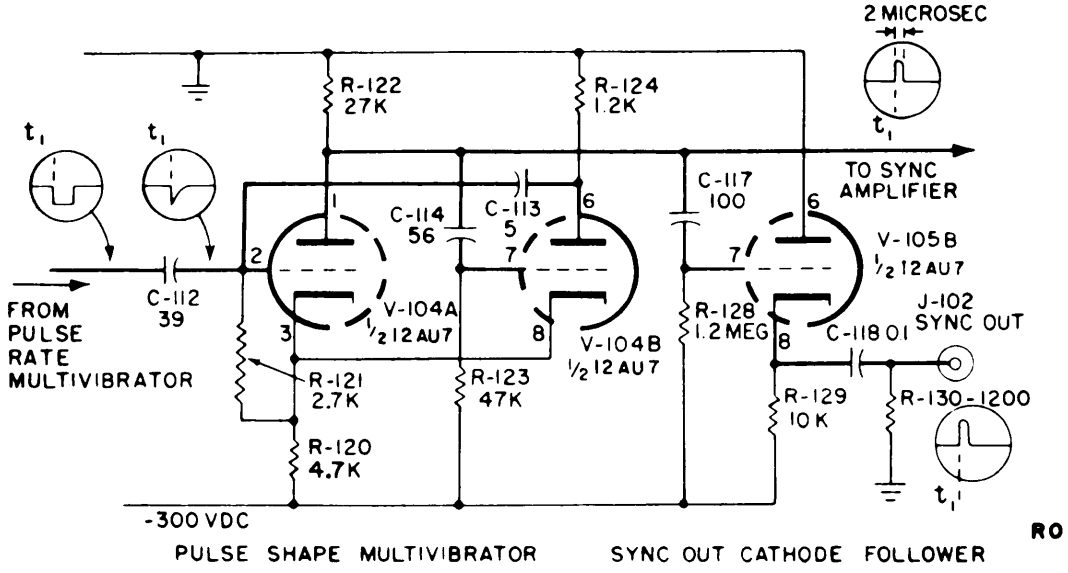


Figure 4-6. Schematic of Pulse Shaper.

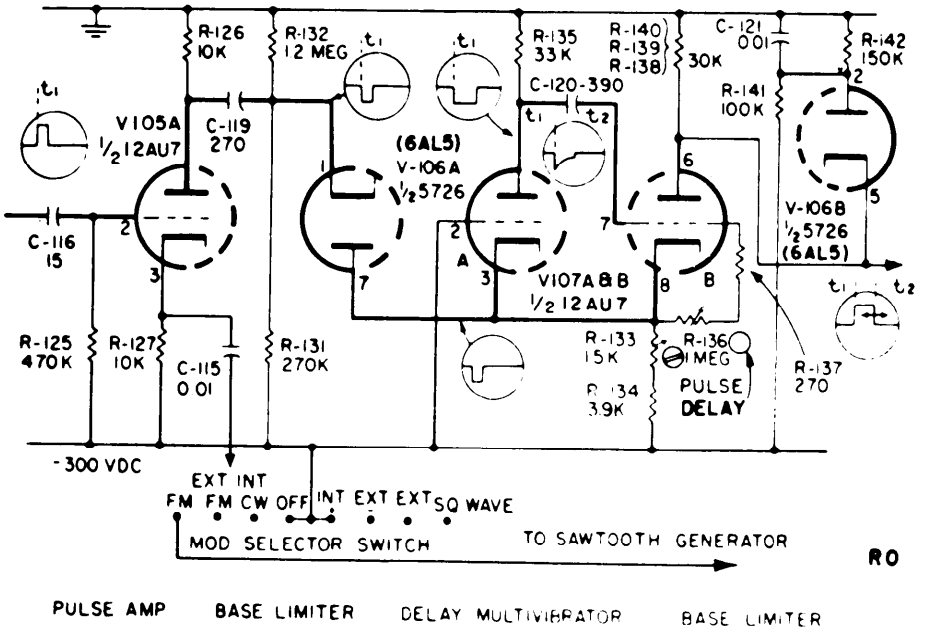


Figure 4-7. Schematic of Pulse Amplifier and Delay Multivibrator.

pulse repetition frequency and the fact that the capacitor charges exponentially with time. Otherwise, the capacitor would charge to a higher potential at the low repetition frequencies than at the high frequencies. The Diode, V108A, limits the charge to a value that can be reached at the highest repetition frequencies, and prevents it from going higher regardless of the charging time available.

4-26. When the positive pulse from V109A is applied to the grid, the tube ionizes and capacitor C127 discharges through the tube and cathode resistors R151 and R152. This causes a positive pulse to appear across the cathode resistors. When capacitor C127 is nearly discharged and the plate voltage is at a very low value, the tube deionizes and returns to the resting condition. By this time the pulse on the grid has

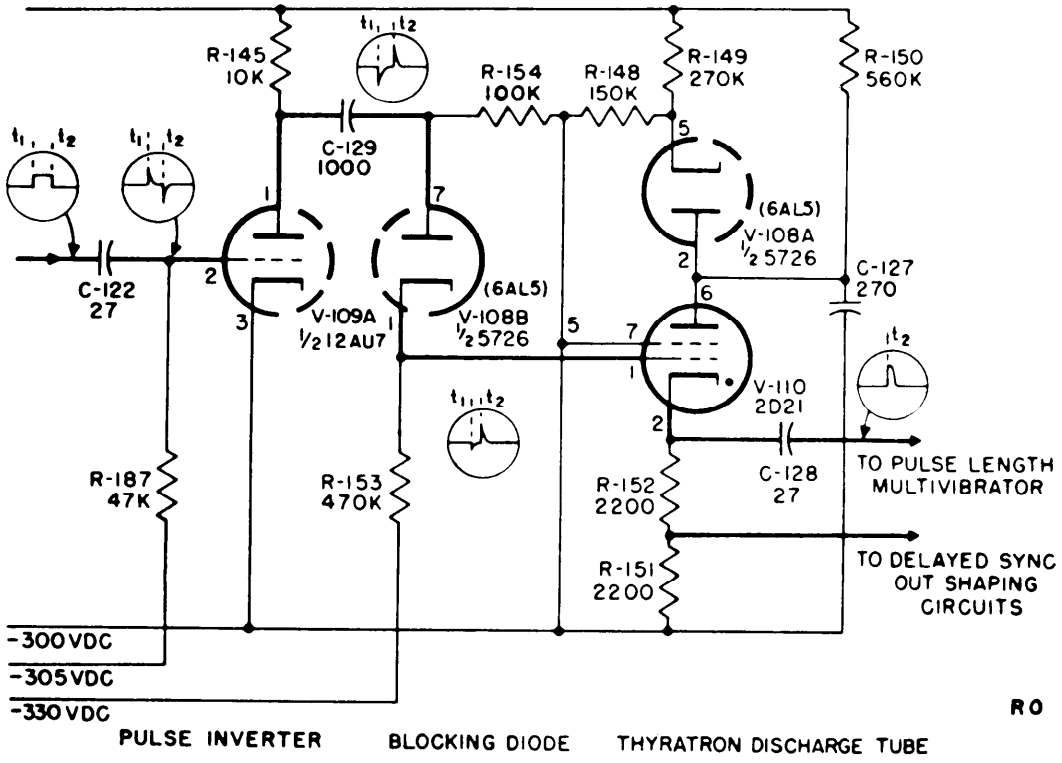


Figure 4-8. Schematic of Thyratron Discharge Circuits

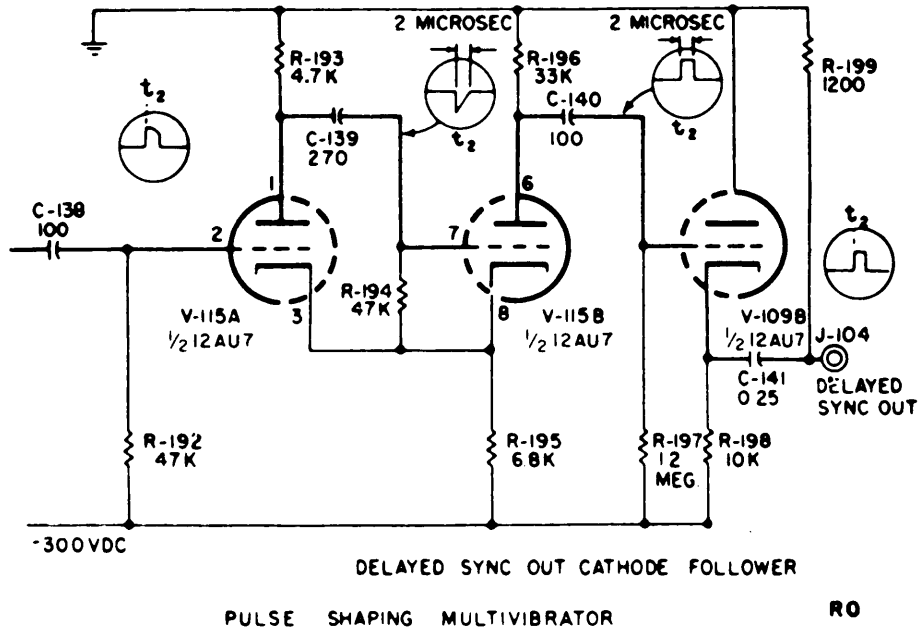


Figure 4-9. Schematic of Pulse-Shaping Multivibrator and Delayed Synchronization Cathode Follower.

decayed and the grid bias is again -315 V. Capacitor C127 is rapidly recharged to its resting voltage of approximately 100 V and is maintained at this value through the action of the Diode circuit, V108A, previously explained. The spike pulse occurring in the cathode circuit at t_2 is applied to the Pulse Length Multivibrator and to the delayed synchronization pulse output circuits.

4-27. DELAYED-OUTPUT PULSE SHAPER AND CATHODE FOLLOWER. The Delayed Output Pulse Shaper (Figure 4-9) is a rnultivibrator comprised of the two triode sections of a type 12AU7 tube, V115. One half of another 12AU7 dual triode tube, V109B, is connected as a Cathode Follower. The positive spike developed in the cathode circuit of the Thyratron Discharge Tube is applied to grid of V115A through capacitor C138 at time t_2. The section of the multivibrator formed by V115A is cut off, its negative bias being established by the current through cathode resistor R195.

4-28. The section comprised of V115B is conducting in the resting condition as its grid is returned to the cathode through resistor R194. The positive leading edge of the pulse from V110 causes the multivibrator to switch, cutting off current through V115B and causing the voltage at its plate to rise.

4-29. The time constant of the circuit is approximately 2-µs. At the end of this time, capacitor C139 is discharged (through resistors R194 and R195) to a point where V115B again conducts and completes the cycle. The output at the plate of V115B is a positive pulse of 2-µs duration. This pulse is coupled to V109B, the Cathode Follower.

4-30. Tube V109B is employed as an impedance transformer, receiving the pulse from the high-impedance plate circuit of the multivibrator and delivering it to the relatively low impedance across the DELAYED SYNC. OUT connector for synchronizing external equipment.

4-31. PULSE-LENGTH MULTIVIBRATOR. The Pulse Length Multi vibrator (Figure 4-10) is a one-shot multivibrator employing a type 12AU7 tube, V111. The circuit employs capacitive cathode-to-cathode coupling to secure the positive feedback action. This avoids any feedback connection to the plate of V111A, reducing stray capacitance that would tend to degrade the voltage rise and fall times. Peaking inductance L101 is also employed in the plate circuit to further steepen the wave form.

4-32. The section comprised of V111A is cut off since a bias of -30 V is applied to its grid. This places the V111A side of capacitor C130 at a potential of -300 V. The second section is at saturation because its grid

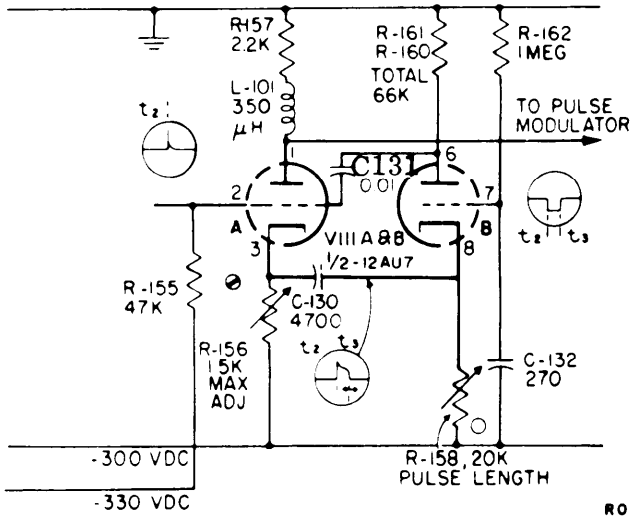


Figure 4-10. Schematic of Pulse-Length Multivibrator.

is connected to the positive supply point (ground) through resistor R162. As a result, the other side of capacitor C130 is at a relatively higher potential due to the drop across resistor R158.

4-33. When the positive pulse at t_2 is applied to the grid of V111A, V111A immediately conducts, causing the V111A side of capacitor C130 to rise to the potential established by the current through resistor R156; thus, resistor R156 acts as a maximum delay-time adjustment for the circuit.

4-34. The voltage rise across resistor R156 is applied to the cathode of V111B, causing it to become more positive with respect to its control grid. This cuts off the tube rapidly, since the grid is maintained at the cathode potential by the time constant of R162 and C132.

4-35. Capacitor C130 is now charged and commences to discharge. The time required to discharge to a point where V111B again conducts determines the duration of the negative output pulse. The width is adjusted by R158, the PULSE WIDTH control. This control can be adjusted to provide pulses between 0.5 and 10 µs. The output of the Pulse Length Multivibrator is a negative pulse, starting at t_2 and ending at t_3. Diodes CR101, CR102 serve to limit the negative pulse to approximately 10 V peak-to-peak. The limited pulse is applied to Klystron Modulator tube V701.

4-36. KLYSTRON MODULATOR (618C). The Klystron Modulator (Figure 4-11) is comprised of tube V701 and associated parts. The modulation pulse is applied through capacitor C701 to the grid of V701. The output of the Klystron Modulator is developed across plate resistors R703 and R705. Diode CR703 serves as a clipper to limit the amplitude of the pulse applied to the Klystron. When the pulse at the plate of V701 is more positive than the voltage present at the cathode of CR703, the diode conducts and limits the pulse. The voltage at which CR703 conducts is established by the setting of potentiometer R706, part of a voltage divider (R702, R704, R706) connected between the -300 and -1000 volt lines. When the Signal Generator frequency control is at a predetermined setting, switch S103 is actuated and places potentiometer R707 in parallel with a portion of potentiometer R706. This results in diode CR703 clipping at a more negative voltage point on the modulation pulse. During any operating mode but amplitude modulation (pulse or square wave), the SYNC SELECTOR switch (S102) opens the cathode of V701, and thus disables the Klystron Modulator.

4-37. KLYSTRON MODULATOR (620B). The Klystron Modulator (Figure 4-12) is comprised of tube V701 and associated parts. The modulation pulse is applied through capacitor C701 to the grid of V701. The output of the Klystron Modulator is developed across plate resistors R703 and R705. Diode CR703 serves as a clipper to limit the amplitude of the pulse applied to the Klystron. When the pulse at the plate of V701 is more positive than the voltage present at the cathode of CR703, the diode conducts and limits the pulse. The voltage at which CR703 conducts is established by the setting of potentiometer R706, part of a voltage divider (R702, R704, R706) connected between the -300 and -1000 volt lines. During any operating mode but amplitude modulatlon (pulse or square wave),

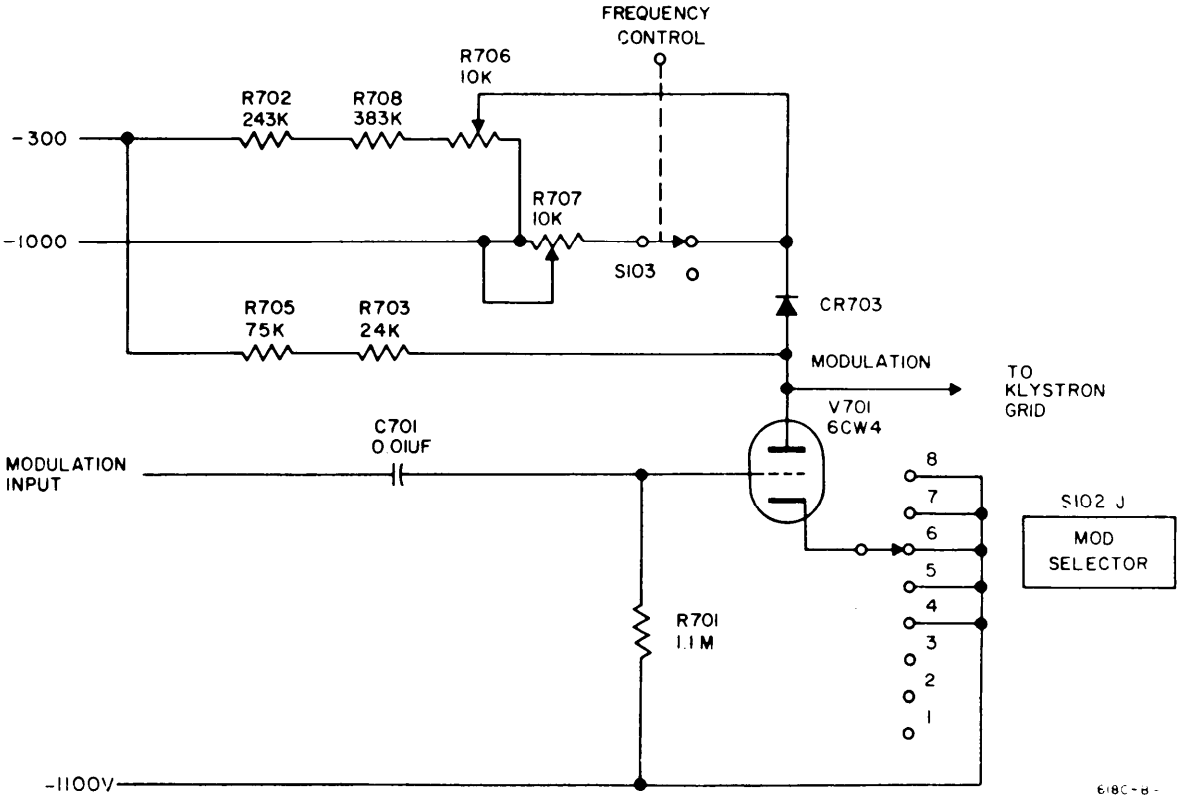


Figure 4-11. Schematic of Klystron Modulator (618C).

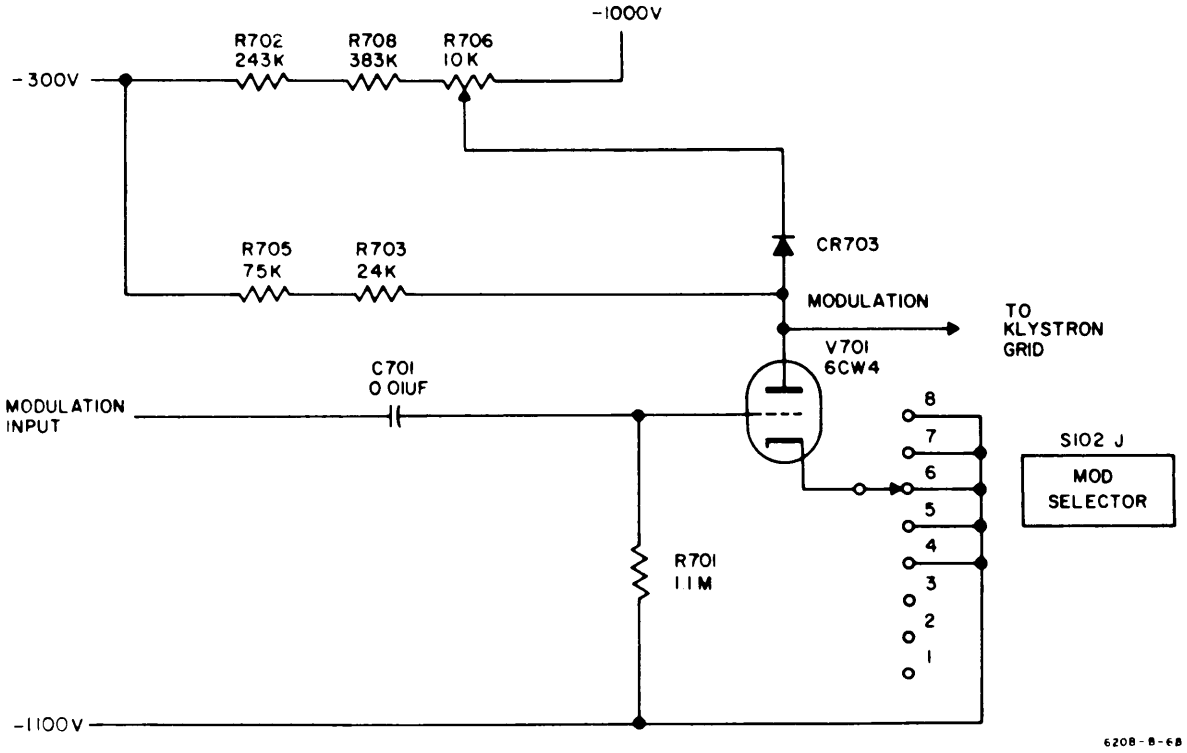


Figure 4-12. Schematic of Klystron Modulator (620B).

the SYNC SELECTOR switch (S102) opens the cathode of V701, and thus disables the Klystron Modulator.

4-38. INTERNAL FM MODULATOR. When MOD. SELECTOR switch S102 is in the FM INT position, the Thyratron Discharge tube comprises a relaxation oscillator (Figure 4-13). This oscillator develops a sawtooth waveform that is applied to the RF Oscillator repeller.

4-39. Capacitors C124, C125, C126, and resistors R146, R147 determine the time constant of the sawtooth

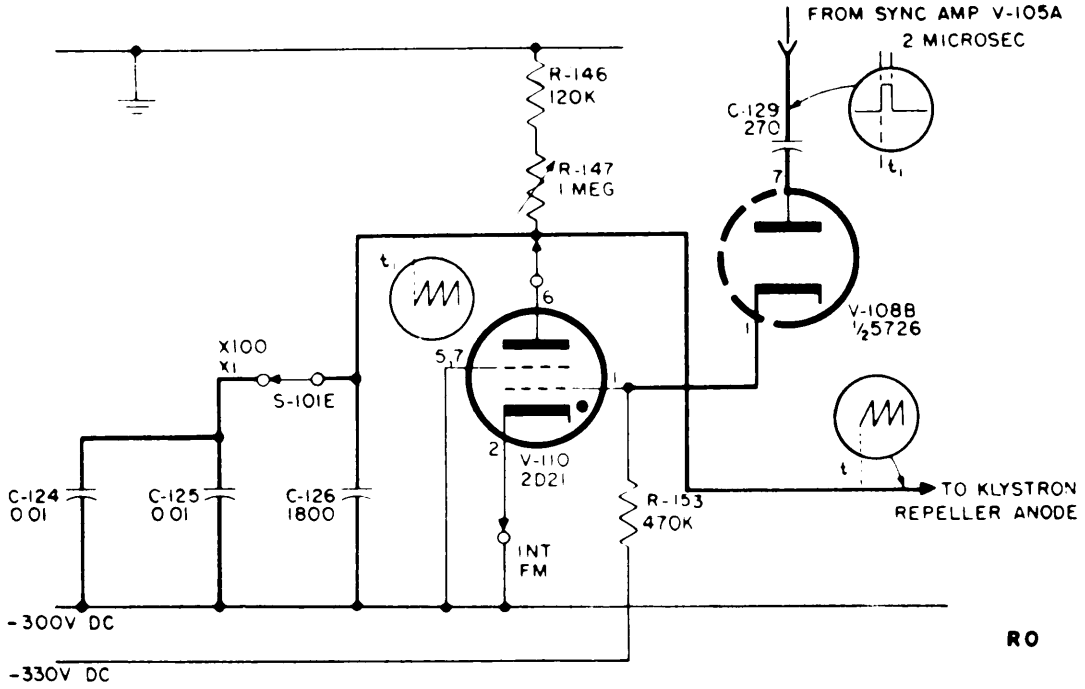


Figure 4-13. Schematic of Frequency-Modulating Circuit.

output for the Xl range; while C126, R146 and R147 perform the same function for the X10 range. Resistor R147 is ganged with R111 and R114, and adjusted by the PULSE RATE panel control, so that the FM sweep rate and the internal pulse repetition rate may be controlled by the same control.

4-40. The relaxation oscillator is triggered by a positive pulse from the cathode of the Pulse Shaper and, when activated, delivers a positive-going sawtooth voltage to the repeller, providing frequency modulation.

4-41. THE OSCILLATOR.

4-42. REFLEX KLYSTRON. The RF oscillator is a reflex klystron, V114, operating with a tunable coaxial-line resonator. The resonant section is coupled to the resonator grids of the klystron as shown in Figures 4-14 and 4-15 and in the equivalent circuit Figure 4-16.

4-43. Oscillation may be explained assuming that a small-amplitude, RF noise voltage exists across the resonator grids. The electron stream directed through the resonator grids from the cathode is velocity modulated by this small RF voltage. The stream ceases to be uniform, and may be thought of as having some of its electrons accelerated and some retarded. The resultant stream in the drift space past the resonator grids consists of bunches of electrons, and is therefore said to be velocity modulated.

4-44. As this bunched stream (or velocity modulated stream) moves toward the negative-charged repeller it is repulsed back through the resonator grids. Since the stream is bunched, it induces an RF voltage across the grids.

4-45. If the transit time is in phase with the small thermal RF voltage initially assumed to be across the grids, it strengthens the bunching effect on the following stream. Upon reflection, the electron stream following will again strengthen the resonator grid voltage. This process, however, does not continue indefinitely.

4-46. A point is ultimately reached where the fundamental component of the bunching current decreases in magnitude, since energy is now being used to overcome the circuit resistances. There is a point, therefore, where there is just sufficient reflected energy to satisfy the requirements for stable oscillation.

4-47. Assuming that stable oscillation exists when a sudden change in repeller voltage is introduced, the transit time of the electron stream (as it enters and departs the repeller field) is changed. The current bunching effect would change also, and a new RF voltage would be produced across the resonator grids. This velocity modulation then changes the circuit oscillating frequency.

4-48. The situation previously described is valid for relatively small variations in repeller voltage. Excessive variations alter the relationship between the resonator voltage and the transit time of the electron stream, producing dead spots (no oscillation) or conditions of oscillation in undesired modes.

4-49. The term mode, in this sense, describes two different but interrelated characteristics. One mode is the characteristic of the cavity (or line-section resonator), which is resonant at a series of frequencies when the effective electrical length of the line is 1/4 wavelength, 3/4 wavelength, or 5/4 wavelengths. These effective electrical lengths are termed resonator modes.

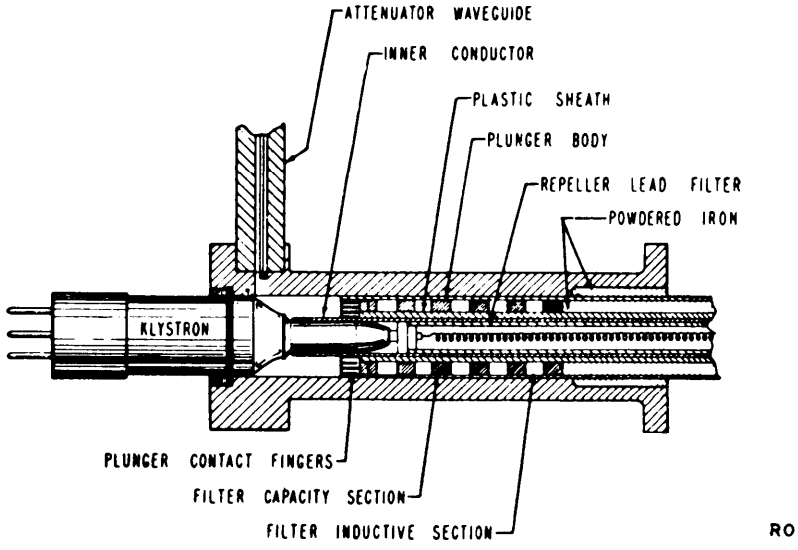


Figure 4-14. Cross Section of RF Oscillator (620B).

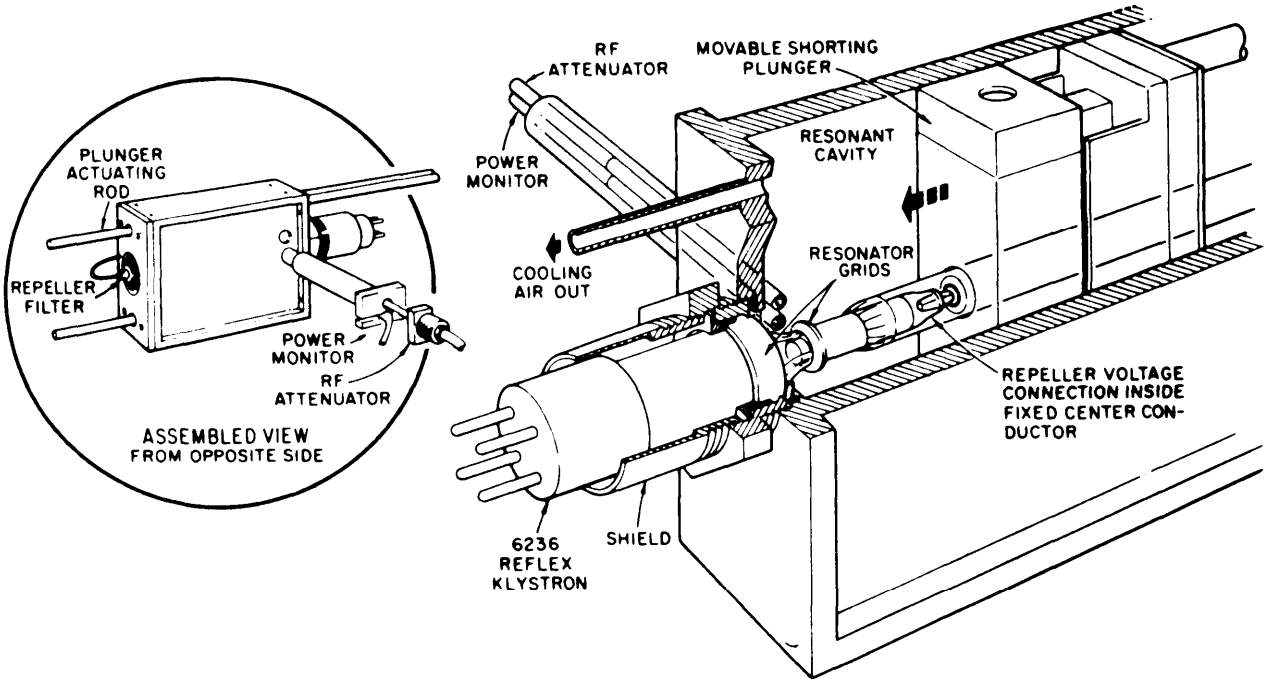


Figure 4-15. Cross-Section of RF Oscillator (618C).

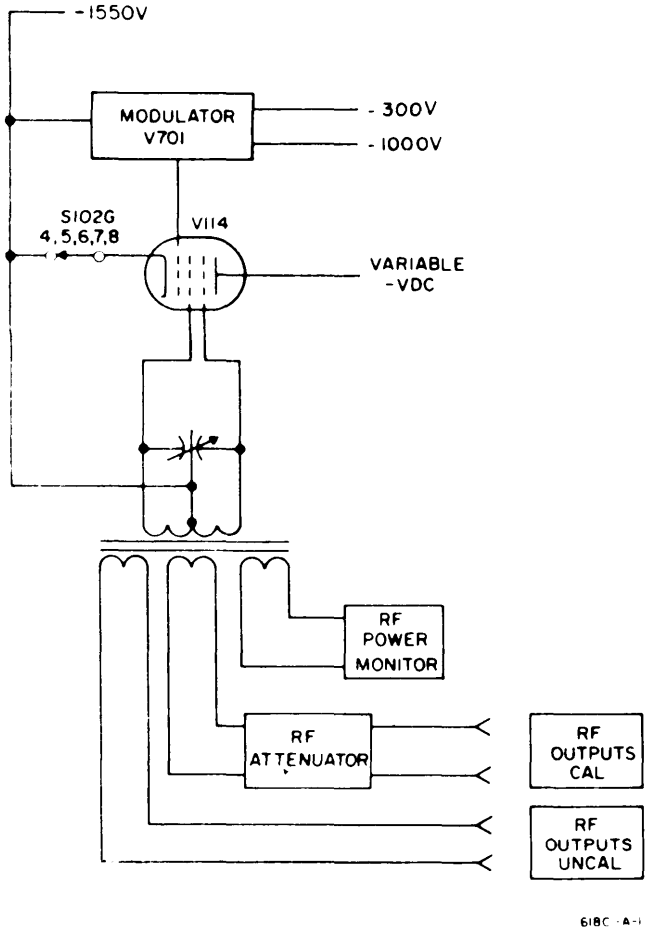


Figure 4-16. Equivalent Circuit of RF Oscillator.

4-50. Another mode is the repeller mode, which describes the round-trip transit time of the electron stream as expressed in the cycles of RF voltage across the resonator grids. Oscillations most easily occur when the transit time equals 3/4, 1-3/4, 2-3/4, 3-3/4, 4-3/4. . . RF cycles. These repeller modes are distinguished by different transit times rather than by different resonant frequencies, and they are functions of repeller voltages. Generally, the value of the repeller voltage increases for a given mode as the mean klystron frequency is increased.

4-51. When a specific repeller mode is desired throughout a given band of frequencies, the repeller voltage is adjusted against the plunger travel (of a tunable resonator, for example) to maintain the relative transit time. Since the repeller mode is a function of transit time, it also remains constant.

4-52. A third use of the term mode is the oscillation mode, which is defined in terms of the repeller mode and the cavity mode. For example, an oscillation mode might be 3/4 wavelength cavity and 3-3/4 wavelength repeller.

4-53. REPELLER VOLTAGE CONTROL (618C). The operating characteristics of a reflex Klystron are such that an optimum value of repeller voltage exists for each operating frequency. This voltage is the value that will cause the bunched electrons to return to the resonator grids at the proper time. Figure 4-17 shows the repeller voltage characteristics for the Klystron over the range employed in the Signal Generator.

4-54. The repeller voltage characteristic shown in Figure 4-17 provides for operation in the 2-3/4 repeller mode. The required voltage for optimum operation

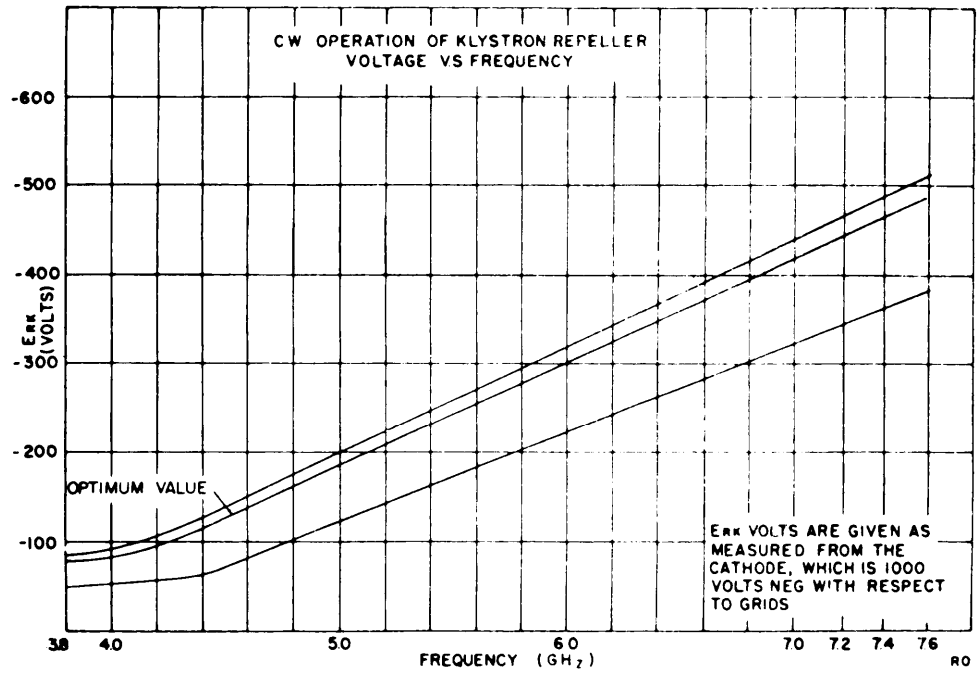


Figure 4-17. Repeller Voltage Versus Frequency (618C).

is essentially linear with frequency for the frequency range above 4400 MHz. In the frequency range from 3,800 to 4,400 MHz the required voltage is not a linear function of frequency but is slightly curved as shown.

4-55. Figure 4-18 shows the 618C circuit that provides negative voltage to the repeller. Potentiometer R174 is a 100,000-ohm wirewound potentiometer that is mechanically ganged with the mechanism that tunes the resonant line, providing a proper voltage to the repeller electrode as the frequency is changed. The values of the resistor R170 and R175 are adjustable to establish the voltage applied across the tracking potentiometer, R174. The values of resistors R173 and R178 are adjustable to provide the required curvature in the repeller voltage characteristic below 4400 MHz.

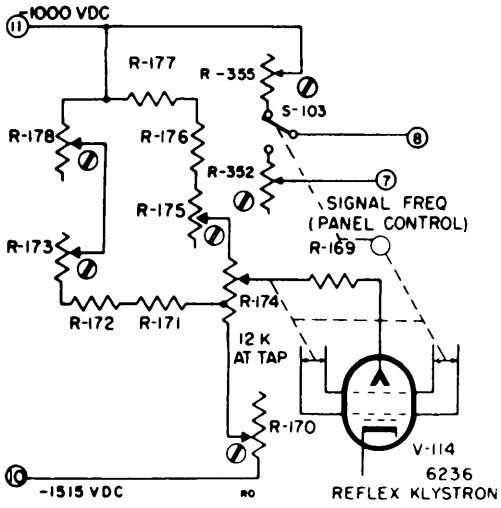


Figure 4-18. Schematic of Repeller Tracking Circuits (618C).

4-56. The Δ F control, R523, is part of a voltage-divider network (R520-R525) that parallels the klystron. Variation of R523 causes small changes in the klystron repeller voltage and thus small changes in the frequency of oscillation.

4-57. PARALLEL-PANEL RESONATOR (618C). The resonator employed in the Model 618C is known as a parallel-plane resonant line. In its physical shape it resembles a rectangular box type cavity with a circular center element and a rectangular plunger to vary the cavity depth. Actually, the line is a direct development from a circular coaxial line as shown in Figure 4-19.

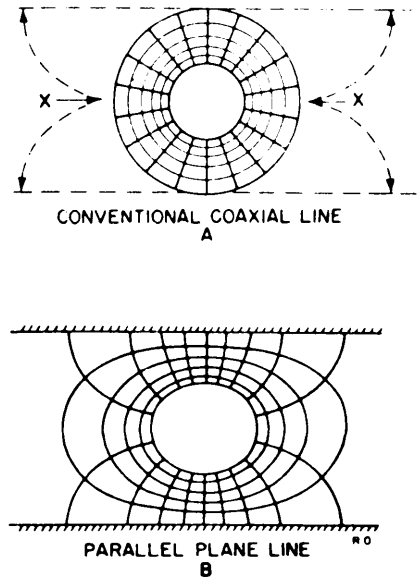


Figure 4-19. Field Configuration of Coaxial and Parallel-Plane Lines (618C).

Part A of Figure 4-19 shows such a line, and the field configurations that exist when it is excited electrically. The resonant frequency of such a line with one end shorted is determined by its electrical length in a direction parallel to the center conductor. The other dimensions of the line may play a very small part in determining the oscillating frequency.

4-58. The evolution of the parallel-plane line from the coaxial line may be described by reference to Figure 4-19, parts A and B. Assume the outer conductor were cut at the points X and the two semi-lines thus created were flattened out as shown by the horizontal dotted lines. The voltage and current configurations would then take the form shown in part B. To carry this example through in complete detail, the cross-section of the center conductor would take a slightly elliptical form of perfect configurations. However, for practical purposes, this is not necessary, and a circular center conductor is used.

4-59. The line, as shown in Figure 4-19, part B, is not enclosed on the short sides, and it is possible to operate it in this manner. However, sides are provided to prevent stray RF leakage currents.

4-60. The parallel-plane line depends for its resonant frequency upon its electrical length and consequently may be tuned by simple mechanical means and can be directly calibrated. This type of cavity provides a resonator in which simple and straight-forward methods can be employed to provide broadband suppression of the various parasitic resonances that occur when other physical dimensions approach the frequency-determining electrical dimensions.

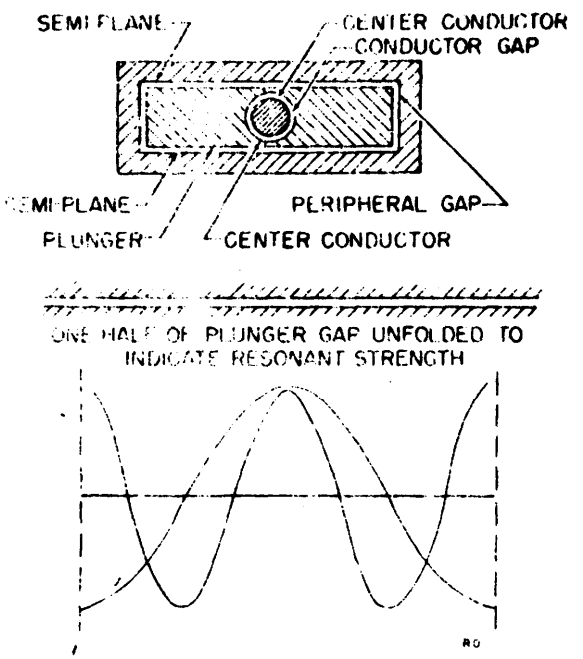


Figure 4-20. Plunger Resonances in Uncompensated Parallel-Plane Line Resonator (618C).

4-61. Figure 4-20 shows a cut-away view of the resonant line and the other components of the parallel-plane oscillator. The klystron is mounted so that one of the resonator grids is coupled to the two semi-lines while the other is coupled to the circular center conductor. The repeller voltage is applied through an insulated filter in the center conductor while the other potentials required to operate the tube are applied through the tube base pins.

4-62. PLUNGER RESONANCE (618C). The plunger employed in the parallel-plane resonator is of the noncontacting type and a small air gap exists between the periphery of the plunger and the surfaces of the semiplanes and sidewalls, as shown in Figure 4-20.

4-63. The gap has a physical length of approximately 17 centimeters, and an electrical length such that it has a two-cycle and a four-cycle resonant frequency occurring near or in the frequency range of the oscillator. As shown in Figure 4-20, these frequencies correspond to one-half and one-quarter of the electrical length of the periphery of the plunger. A similar gap exists between the center conductor and the plunger, However, the length of this gap is such that no resonances occur in the frequency range of the oscillator.

4-64. Compensation is applied to control resonance of the line formed by the peripheral plunger gap in the resonator.

4-65. REPELLER ACTION (620B). As seen in Figure 4-21, the repeller mode for the Model 620B shifts from the 3-3/4 mode to the 4-3/4 mode.

4-66. The 3-3/4 repeller mode is used for the 7- to 9-GHz range, and the 4-3/4 repeller mode is used above 9 GHz.

4-67. The repeller voltage is controlled by a tapered potentiometer ganged to track with the frequency-tubing plunger; it includes a switch which steps the repeller voltage less negative at approximately 8800 GHz to change the transit time to 4-3/4 RF cycles.

4-68. The Δ f control, R523, is part of a voltage-divider network (R520-R525) that parallels the klystron. Variation of R523 causes small changes in the klystron repeller voltage and thus small changes in the frequency of oscillation.

4-69. RESONATOR (620B). The cavity resonator for the klystron is a tunable coaxial line with a shorting plunger. The repeller voltage, plunger, and frequency dial are gang-tuned.

4-70. The resonant frequency for a circular coaxial resonator with one end shorted, is determined by the electrical length of the resonator in a direction parallel to the center conductor. The other dimensions of the line are almost negligible in determining the fundamental frequency of the section.

4-71. UNDESIRED MODE SUPPRESSION (620B). Cavity resonator systems have a tendency to operate in the 1/4-wavelength cavity mode, and from an efficiency and power output standpoint it is advantageous

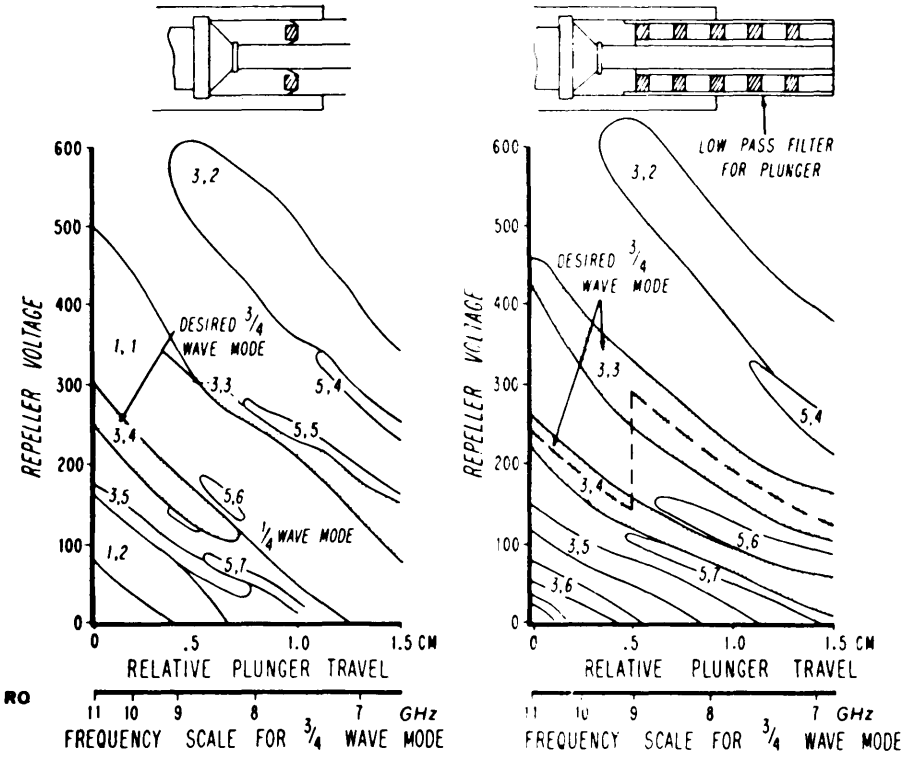


Figure 4-21. Uncompensated and Compensated Mode Structure (620B).

advantageous to operate in the 1/4-wavelength cavity mode. As the desired frequency increases, however, operation in this mode is not always feasible.

4-72. As the desired frequency increases, a 1/4-wavelength becomes quite small and plunger placement in the cavity becomes extremely critical and imposes mechanical limitations, making it necessary to select another mode of operation. The 3/4-wavelength cavity mode is employed for the range of the Model 620B.

4-73. As seen in Figure 4-21 the dominant effects of the 1/4-wavelength mode consist of undesirable mode interference. A study of this 1/4-wavelength cavity and 1-3/4 repeller mode showed that its frequency was below 6000 MHz, considerably below the 7000 MHz low end of the Model 620B. Advantageous use was made of this fact, and the plunger was designed to incorporate a concentric low-pass filter having a cutoff frequency of 6500 MHz.

4-74. PLUNGER CONSTRUCTION (620 B). As seen in Figure 4-14, the space between the center conductor of the resonant line and the inner wall of the plunger consists of a number of high- and low-impedance sections in cascade. This constitutes the filter section, which is terminated in back of the plunger with powdered iron to absorb the energy passed by the filter.

4-75. The effectiveness of this approach to the suppression of the undesired mode is seen in Figure 4-21. The filter prevents the undesired mode from supporting itself; the first section of the filter appears as a low impedance for the higher frequencies of the desired modes. In effect, the klystron tube sees a terminated transmission line at frequencies below 6500 MHz. For frequencies above 6500 MHz, the klystron sees a shorted, tunable, high Q resonator.

4-76. The plunger makes contact with the outer conductor wall by means of long-life contact fingers. Peripheral resonances are suppressed by leading the gap between the plunger and the outer wall with a dielectric plastic sheath. The technique effectively lowers the frequency of the parasitics to a range much lower than that of the generator.

4-77. THE ATTENUATOR (618C). Three pickup loops are located in the resonator to collect RF power. The first is the output attenuator loop which couples the calibrated power to be supplied by the generator to the load through an output connector on the panel; the position of this loop is adjustable so that the output power level may be varied as desired. The second is the power level in the oscillating circuit and establishes a reference point to calibrate the output power. The last pickoff loop provides a source of uncalibrated RF power at a front-panel connector.

4-78. Power is coupled to the load from the RF oscillator by a coupling loop located at a suitable point in the resonant line. This loop slides in a circular waveguide section. The cross-section of the waveguide is very small in relation to the frequencies of operation, and normal propagation down the waveguide will not take place. However, some limited propagation does take place, and the power level decreases exponentially as the distance from the resonant line increases. Thus it is possible, by moving a pickup loop linearly in the waveguide, to secure an output that varies in decibels in proportion to the linear travel.

4-79. This type of attenuator is known as an attenuator of the cutoff type and its characteristics are employed so that the pick-up probe and indicating dial can be moved by a simple gear train and the dial may be calibrated directly in decibels.

4-80. A cross-section of the attenuator and RF pick-up loop is shown in Figure 4-22. The RF pick-up loop is terminated by a special resistor, which is made by coating platinum on a glass bead. This resistor is used to match the attenuator to the output cable, and its dc resistance is approximately 50 ohms.

4-81. The polyiron section on the outside of the probe is designed to absorb power that may leak past the probe in the space between the outer conductor and the waveguide walls.

4-82. THE ATTENUATOR (620B). The attenuator in the Model 620B is direct reading and requires no frequency correction. It is essentially a piston probe sliding in a waveguide beyond cutoff.

4-83. Theoretically, the high frequencies beyond cutoff involved in such a waveguide demand dimensions which would be smaller than practical. Consequently the dimensions used have been increased in favor of practical design. Since the dimensions have been increased, there is a slight error introduced because the frequency-versus-attenuation characteristic is not sharp at the cutoff frequency.

4-84. This error is compensated by distributing it over the frequency and the attenuation ranges of the instrument. The compensation is effected by first halving the error by calibrating the attenuator in the middle of the frequency band (approximately 9 GHz). The half-error now exists at the extremes of the band only.

4-85. The net attenuator power-monitor error is less than the maximum error of the instrument, which must allow for the connector mismatches and a source impedance that is not the ideal 50 ohms resistance presented by the pick-up strip on the attenuator probe (Figure 4-23).

4-86. The small dimensions of the waveguide beyond cutoff necessitated careful design of the pickup loops on the power monitor and attenuator probes. The construction details are shown in Figure 4-24.

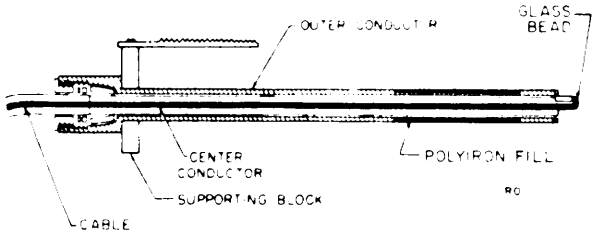


Figure 4-22. Cross-Section View of Attenuator Probe (618C).

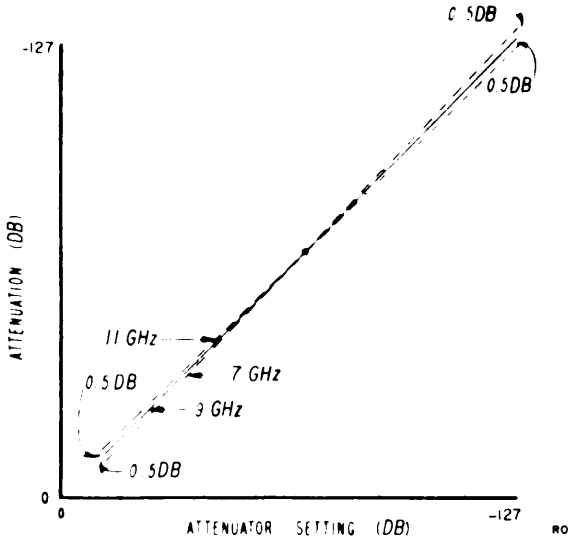


Figure 4-23. Compensation of Attenuator (620B).

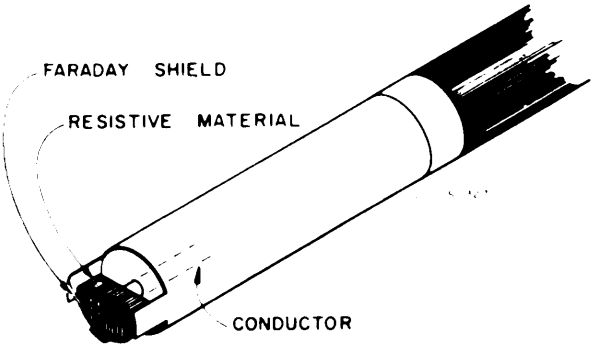


Figure 4-24. Construction Details of Power Monitor Probe (620B).

4-87. THE POWER MONITOR.

4-88. The power monitor circuit is provided to measure and indicate and level of the RF power at the attenuator input.

4-89. The position drive for the attenuator probe is coupled to the calibrated dial, while the drive for the power monitor is coupled to an index which moves around the outside of the calibrated dial. The power monitor probe is nearly a duplicate of the attenuator probe, except that the power picked up by the monitor probe is supplied to a Diode Detector. Figure 4-24 shows the 620B power monitor probe. Figure 4-25 shows the 620B power monitor probe. The output of the detector is applied to the Power Monitor Section (Figure 4-26).

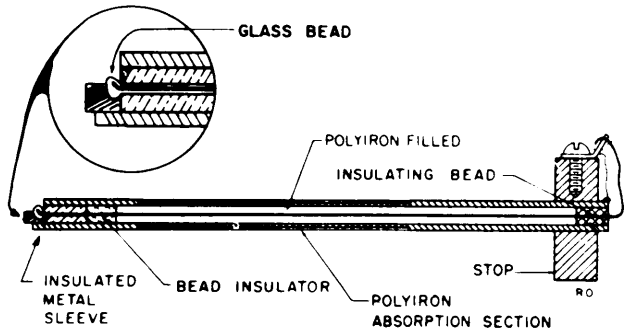


Figure 4-25. Cross-Section View of Power Monitor Probe (620B).

4-90. The Power Monitor Section is composed of a Differential Amplifier acting as a Voltage Comparator. The Differential Amplifier consists of transistors Q601 and Q602 (each a dual-section transistor, with each section in a cascade arrangement), and transistor Q603 acting as a current-feedback generator to increase the input impedance and thus decrease the loading effect on the detected RF signal. The reference input to the differential amplifier is the voltage drop across diode CR602, while the signal to be compared is the detected RF signal. A voltage proportional to the difference in the two input voltages appears between the emitters of Q601A and Q602A, causing the power meter to deflect and indicate the relative power level of the signal Generator output. Potentiometer R612 is the zero-set adjustment for the meter and is adjusted with the MOD. SELECTOR set to OFF (no RF output).

4-91. THE POWER SUPPLIES.

4-92. GENERAL OPERATING PRINCIPLES

4-93. All the dc operating voltage are electronically regulated. Some are obtained directly from regulated supplies, others are derived by voltage division from regulated supplies.

4-94. There are three electronic regulators supplying -300, -1000, and -1550 V. It should be noted that the three power supplies actually develop -300, -700, and -500 V dc; series connection of these voltages results in -300, -1000, and -1550 V. All of the regulators operate as follows. As shown in Figure 4-27, a regulating element (Series Regulator) is connected in series with the load and the dc power source (Rectifier and Voltage Doubler). The resistance of the regulating element is made adjustable so that the voltage at its output will be adjustable. The resistance is adjusted by a control voltage; the higher the control voltage, the higher the output voltage. A sample of the Series Regulator output voltage is compared against a dc reference voltage by a Comparison Amplifier and the difference voltage is inverted and applied to the Series Regulator. As a result, any tendency for the output voltage to change is immediately counteracted by the control voltage, and the supply output voltage remains constant.

4-95. Since the gain of the Comparison Amplifier determines the degree of regulation, it may be followed by an additional Control, or Driver, Amplifier to improve regulation. The Comparison Amplifier is a

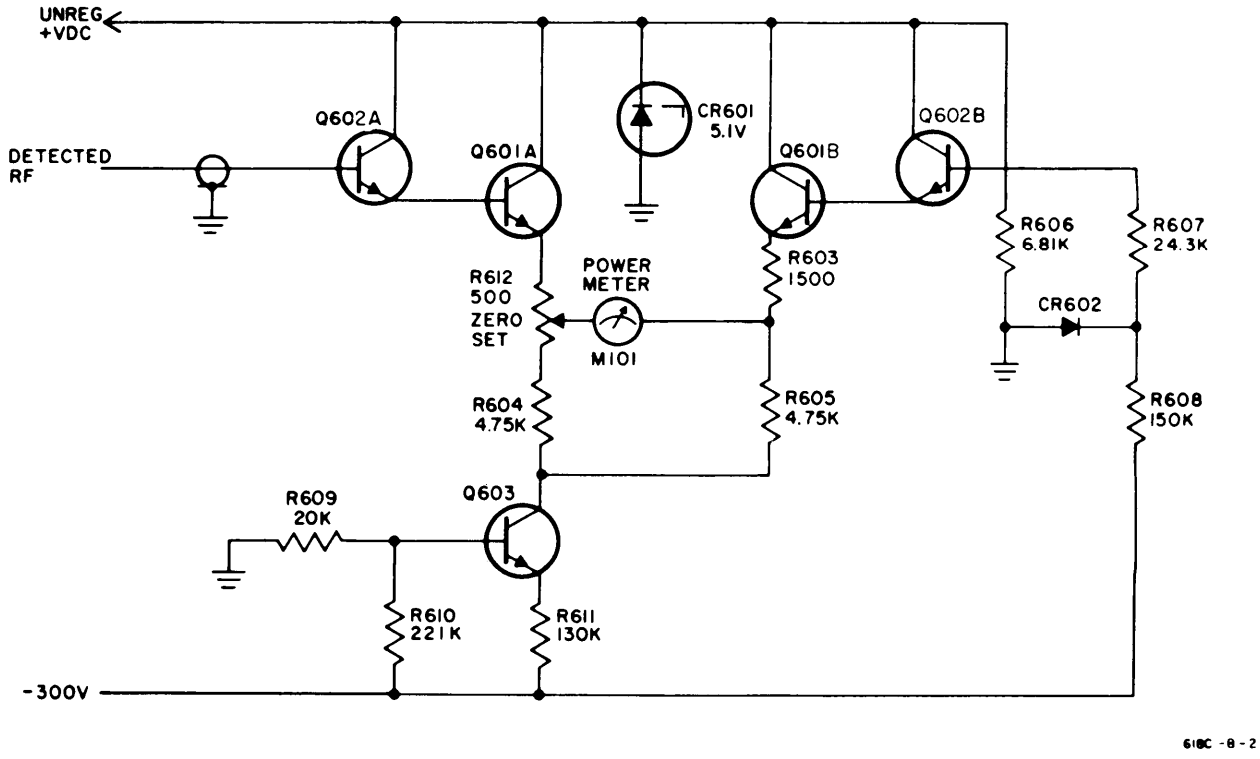


Figure 4-26. Schematic of Power Monitor Circuit.

differential type for temperature stability. The dc reference voltage used for comparison is obtained from voltage-regulator electron tubes, from semiconductor voltage-reference diodes, or from another regulated power supply. When an adjustable power supply is used as the reference for another supply, changing its output level also changes the level of the supply for which it is the reference. Consequently, if this reference varies drastically, the output levels of both supplies change.

4-96. -300 VOLT SUPPLY.

4-97. The -300 V supply operates as explained under General Operating Principles. The reference for this supply (applied to the cathodes of V304 through resistor R375) is obtained from the -1000 V supply. In this power supply the Control (Driver) Stage is, like the Comparison Amplifier, a Differential-Type Amplifier.

4-98. -1000 VOLT SUPPLY.

4-99. The -1000 V supply operates as explained under General Operating Principles, and derives its reference from V402. The Comparison Amplifier, V403 and 404, drives the Series Regulator directly. The Regulator receives its screen voltage from regulator tube V305, which, in turn, uses the -300 V supply as a B+ source; consequently, any drastic variation of the -300 V supply will affect the -1000 V supply.

4-100. -1550 VOLT SUPPLY.

4-101. The -1550 V supply operates as explained under General Operating Principles, and derives its reference from V502. The Comparison Amplifier, V503 and V504, drive the Series Regulator directly. The Series Regulator receives its screen voltage from a voltage divider (R514, R515) across the -300 and -1000 V supplies; hence, any drastic variation in either of these two supplies will affect the -1550 V supply.

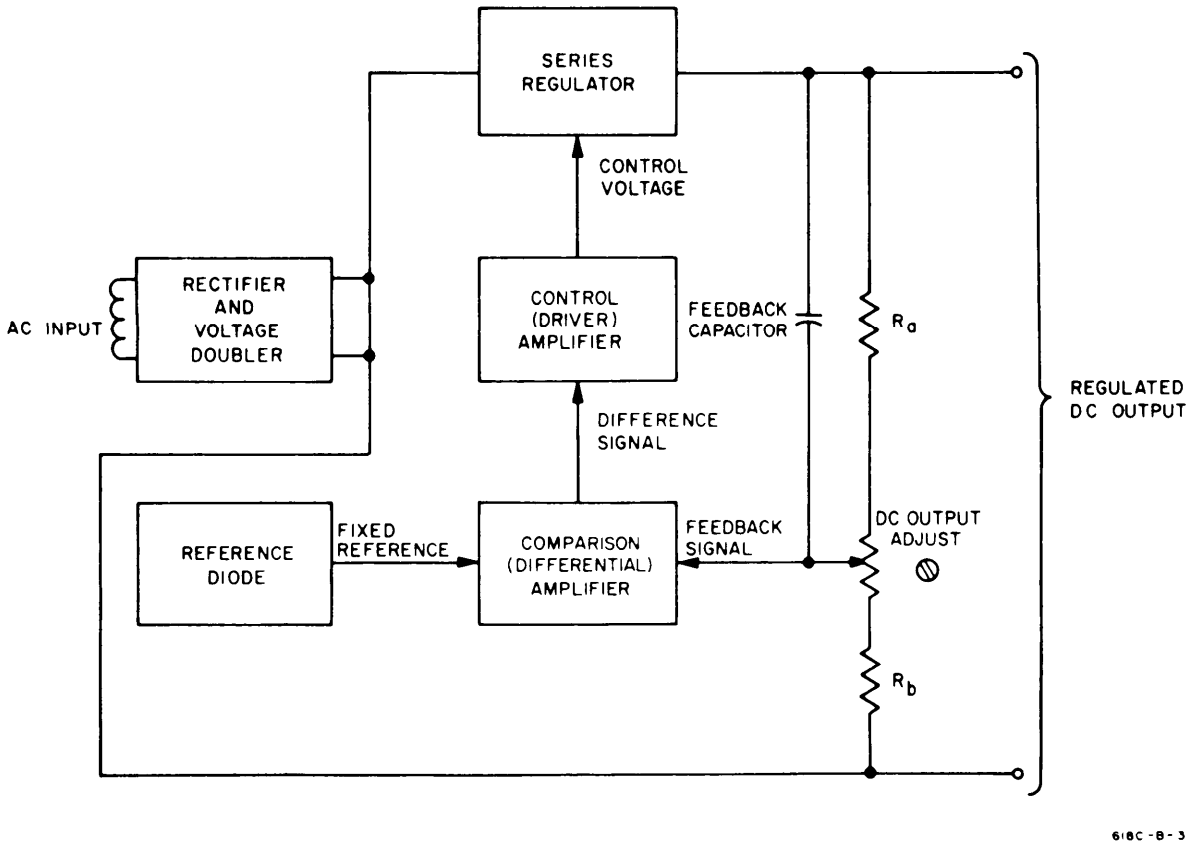


Figure 4-27. Power Supply Block Diagram.

CHAPTER 5

MAINTENANCE

5-1. SCOPE OF MAINTENANCE.

a. The maintenance duties assigned to the operator of the Model 618C/620B are listed below together with a reference to the paragraphs covering the specific maintenance functions. The duties assigned do not require tools or test equipment other than those issued with the equipment.

(1) Operator's daily preventive maintenance checks and services (para 5-4).

(2) Operator's weekly preventive maintenance checks and services (para 5-5).

(3) Cleaning (para 5-7).

b. The maintenance duties assigned to the organizational maintenance repairmen of the equipment are listed below, together with a reference to the paragraphs covering the specific functions. The duties assigned do not require tools or test equipment other than those issued with the equipment.

(1) Organizational monthly preventive maintenance checks and services (para 5-6).

(2) Rustproofing and painting (para 5-8).

5-2. PREVENTIVE MAINTENANCE

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, reduce downtime, and assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 5-4 through 5-7 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (para 5-4 and 5-5) outline functions to be performed at specific intervals. These checks and services are designed to maintain Army equipment in a combat-serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and the normal conditions; the References column lists the paragraphs that contain detailed repair or replacement procedures. If the defect cannot be remedied by the operator, a higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with instructions given in TM 38-750.

5-3. PREVENTIVE MAINTENANCE CHECKS AND SERVICES PERIODS.

Preventive maintenance checks and services of the Model 618C/620B are required daily, weekly, and monthly.

a. Paragraph 5-4 specifies the checks and services that must be accomplished daily, or under the special conditions listed below:

(1) Before the equipment is taken on a mission.

(2) When the equipment is initially installed.

(3) When the equipment is reinstalled after removal for any reason.

(4) At least once a week, if the equipment is maintained in standby condition.

b. Paragraphs 5-5 and 5-6 specify additional checks and services that must be performed weekly and monthly. Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 5-6) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

5-4. OPERATOR'S DAILY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART.

Sequence No.	Item to be Inspected	Procedure	References
1	Signal Generator 618C/620B	Check equipment for completeness and general condition.	App B.
2	Exterior surfaces	Clean exterior surfaces of equipment.	Para 5.7.
3	External receptacles	Inspect external receptacles for breakage and for firm seating.	
4	Meter glass	Inspect front panel glass window for damaged housing, broken glass, physical damage, dust, or moisture.	
5	Knobs, controls, and switches	During operation (item 6), check knobs, controls, and switches for proper mechanical action. Action must be positive, without backlash, binding, or scraping.	
6	Operation	During operation, be alert for any abnormal indications.	

5.5. OPERATOR'S WEEKLY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART.

Sequence No.	Items to be inspected	Procedure	References
1	Cables	Inspect external cables for cuts, cracked, or gouged jackets, fraying, or kinks.	
2	Hardware	Inspect all exterior hardware for looseness and damage. The Models 618C and 620 cover, carrying handle, hinges, and all bolts and screws must be tight and not damaged.	
3	Preservation	Inspect equipment to determine that it is free of bare spots, rust, and corrosion. If these conditions exist, refer to a higher category maintenance for repair.	Para 5-7 and 5-8

5.6. ORGANIZATIONAL MONTHLY PREVENTIVE MAINTENANCE CHECKS AND SERVICES CHART.

Sequence No.	Item to be inspected	Procedure	References
1	Publications	Check to see that publications are complete, serviceable, and current.	DA PAM 310-4
2	Modification work orders	Check to see that all URGENT MWO's have been applied and that all NORMAL MWO's have been scheduled.	DA PAM 310-7
3	Completeness	Check equipment for completeness and general condition.	App B.
4	Cleanliness	Clean exterior surfaces of equipment	Para 5-7
5	Preservation	Inspect equipment to determine that it is free of bare spots, rust, and corrosion.	Para 5.7 and 5.8
6	External receptacles	Inspect external receptacles for breakage and for firm seating.	
7	Meter glass	Inspect front panel glass window for damaged housing, broken glass, physical damage, dust, or moisture.	
8	Cables	Inspect external cables for cuts, cracked, or gouged jackets, fraying, or kinks.	
9	Hardware	Inspect all exterior hardware for looseness and damage. The signal generator cover, carrying handle, hinges, and all bolts and screws must be tight and not damaged.	
10	Operation	During operation, be alert for any abnormal indications.	

5.7 CLEANING.

Inspect the exterior of the Model 618C/620B Signal Generator. The exterior surface must be free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean, soft cloth.

Warning: Prolonged breathing of cleaning compound is dangerous; provide adequate ventilation. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on the hands.

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with Cleaning Compound (Federal Stock No. 7930-395-9542).

c. Remove dust or dirt from plugs and jacks with a brush.

Caution: Do not press on the meter face (glass) when cleaning; the meter may become damaged.

d. Clean the front panel, meter, and control knobs; use a soft, clean cloth. If necessary, dampen the cloth with water; mild soap may be used for more effective cleaning.

5.8 RUSTPROOFING AND PAINTING.

a. Rustproofing. When the finish on the Model 618C/620B Signal Generator has become badly scarred or damaged, rust and corrosion can be prevented by touching up the bare surfaces. Use No. 000 sandpaper to clean the surface down to the bare metal. Obtain a bright, smooth finish.

b. Painting. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB SIG 364.

5.9 LUBRICATION INSTRUCTIONS.

a. Gasoline should not be used as a cleaning fluid for any purpose. When the equipment is overhauled or repairs are made, clean the parts with cleaning compound.

b. Do not use excessive amounts of Lubricating Oil, Instrument (OAI) (FSN 9150-664-6518) and do not allow connections to become greasy.

c. Be sure that lubricants and points to be lubricated are free from sand, grit, or dirt. Use cleaning compound to clean all parts. Before lubrication, clean all surfaces to be lubricated; use a lint-free cloth dampened with cleaning compound. Keep cleaning compound off surrounding parts.

d. Lubrication intervals designated are for daily 8-hour periods of operation. For longer periods of operation, intervals should be shortened.

Table 5-1. Test Equipment Required for Performance Testing

Instrument	Critical Specification	Recommended Models
Thermistor Mount	Frequency range: 3.8 to 11 GHz SWR: 2.0 max	hp 8478A
Power Meter	Power range: 0 to -30 dBm Accuracy: ±3%	hp 431B/431C
Adjustable Transformer	Output voltage range: 103.5-126.5 and 207-253 volts ac	General Radio W10MT3A
Electronic Counter	Frequency range; 50 to 500 MHz Accuracy: ±1 count ±3 parts in 10^9	hp 5245L with 5253B plug-in
Microwave Frequency Converter	Frequency range: 3.8 to 11 GHz Must contain built-in discriminator to measure FM deviation	hp 2590A
Oscilloscope	Vertical sensitivity: 0.05V/cm Bandwidth: 50 MHz	hp 175A with1750B plug-in
Crystal Detector	Frequency range: 3.8 to 11 GHz Frequency response: +0.5 dB per octave SWR: 1.5	hp 423A
Oscillator	Frequency range: 40 Hz to 4 KHz Voltage output: 0 to 10 volts rms Frequency Accuracy: ±2%	hp 200C/D
Vacuum Tube Voltmeter	Range: 0 to 10 volts ac Accuracy: ±3% of full scale	hp 410B/410C
Pulse Generator	Frequency range: 1000 Hz Voltage output ±20 and ±70 volts peak Pulse width: 0.5 and 2500 micro-seconds	hp 214A
Spectrum Analyzer	Frequency Range: 3.8 to 11 GHz IF Bandwidth: 10 KHz	hp 8551/851A/B

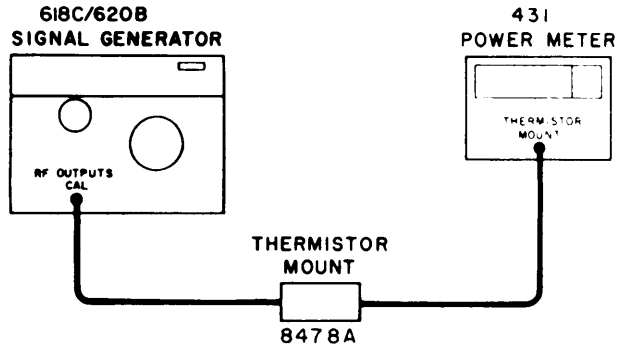


Figure 5-1. Setup for Testing RF Output Accuracy.

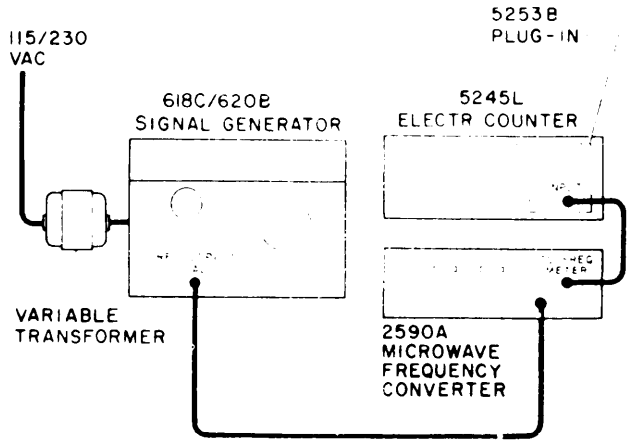


Figure 5-2. Setup for Testing Frequency Accuracy.

5-10. CORRECTIVE MAINTENANCE.

5-12. The following paragraphs provide instructions for performance testing, calibrating, troubleshooting, and repairing the Signal Generator.

5-13. MAINTENANCE PRECAUTIONS.

WARNING

VOLTAGES IN EXCESS OF 1550 VOLTS INSIDE CABINET. USE EXTREME CARE WHEN SIGNAL GENERATOR IS REMOVED FROM CABINET.

5-14. PERIODIC INSPECTION.

5-15. CLEANING.

5-16. If the equipment has been subjected to unusual conditions (excessive moisture, dust, heat, vibration, etc.), it is suggested that the instrument be removed from the cabinet and inspected for dirt or moisture accumulation, loosened components, or any possible sign of damage. Forced air under medium pressure is recommended for dusting and drying, although care must be taken not to vary the settings of the internal-adjustment potentiometers and components during the process. Inspect the air filter regularly and, if necessary, remove and wash in detergent and water. Dry filter and replace: no oiling or coating of the filter is necessary. Unrestricted air flow gives longest component life. Keep the filter clean.

5-17. LUBRICATION.

5-18. No routine lubrication is needed. Lubricate mechanical parts (frequency drive gears, drive mechanism) only when necessary, using a light machine oil. Lubricate moving parts, such as the attenuator and power-monitor probe rack gears, with dry molybdenum or graphite lubricant. The cavity plunger is permanently lubricated during manufacture and requires no subsequent lubrication.

5-19 PERFORMANCE TESTS.

5-20. PURPOSE.

5-21. The following paragraphs check performance for incoming inspection, periodic evaluation, troubleshooting, and calibration. The tests can be performed without access to the Signal Generator interior.

5-22. TEST EQUIPMENT REQUIRED.

5-23. The test instruments required to make the performance tests are listed in Table 5-1, Test instruments other than those listed may be used provided performance equals or exceeds Critical Specifications.

5-24. RF POWER-OUTPUT ACCURACY CHECK:

a. Connect Signal Generator in test setup shown in Figure 5-1.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . CW
POWER SET . . . . . 0 dB on front-panel meter
OUTPUT ATTN . . . . . 0 dB

c. Adjust 618C Signal Generator frequency control from 3.8 to 7.6 GHz; Power Meter should indicate 0 ± 3 dBm.

c. Adjust 620B Signal Generator frequency control from 7 to 11 GHz; Power Meter should indicate 0±3 dBm.

d. Adjust OUTPUT ATTEN control from 0 to -30 dBm in 1-dB steps; Power Meter indication should agree with OUTPUT ATTEN setting ±3 dBm from 0 to -7 dBm and ±2 dBm from -7 to -30 dBm.

5-25. FREQUENCY ACCURACY, STABILITY, AND Δ FM CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-2.

b. Adjust variable transformer for 115 (or 230) V.

c. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . CW
Frequency (618C) . . . . . 3.8 GHz
Frequency (620 B) . . . . . 7 GHz
POWER SET . . . . . 0 dBm
Δ F . . . . . Centered

d. Adjust Signal Generator OUTPUT ATTEN control for sufficient output to drive Microwave Frequency Converter.

e. Adjust Microwave Frequency Converter and Electronic Counter to measure frequency.

f. (618 C.) Electronic Counter shall indicate 3.762 to 3.838 GHz; record indication.

f. (620 B.) Electronic Counter shall indicate 6.930 to 7.070 GHz; record indication.

g. (618C.) Adjust variable transformer for 103.5 (or 207) V; Electronic Counter indication should be within 0.76 MHz of indication recorded in step e.

g. (620B.) Adjust variable transformer for 103.5 (or 207) V; Electronic Counter indication should be within 1.4 MHz of indication recorded in step e.

h. (618C.) Adjust variable transformer for 126.5 (or 253) V; Electronic Counter indication should be within 0.76 MHz of indication recorded in step e.

h. (620B.) Adjust variable transformer for 126.5 (or 253) V; Electronic Counter indication should be within 1.4 MHz of indication recorded in step e.

i. (618C.) Repeat steps c through h for Signal Generator frequencies of 5.7 and 7.6 GHz. Refer to the following table for proper indications:

i. (620B.) Repeat steps c through h for Signal Generator frequencies of 9 and 11 GHz. Refer to the following table for proper indications:

618C Signal Generator Frequency	Line Voltage		
	115/230	103.5/207	126.5/253
5.7 GHz	5.653-5.7057 GHz	±1.04 MHz	±1.04 MHz
7.6 GHz	7.524-7.676 GHz	±1.52 MHz	±1.52 MHz

620B Signal Generator Frequency	Line Voltage		
	115/230	103.5/207	126.5/253
9 GHz	8.910-9.090 GHz	±1.8 MHz	±1.8 MHz
11 GHz	10.890-11.110GHz	±2.2 MHz	±2.2 MHz

j. Adjust transformer for 115 (or 230) V.

k. Adjust Δ F control to extreme ccw position.

m. (618C.) Adjust Signal Generator frequency control to 3.8 GHz.

m. (620B.) Adjust Signal Generator frequency control to 7 GHz.

n. Measure Signal Generator frequency on Electronic Counter; record reading.

p. Adjust Δ F control fully cw, and measure Signal Generator output frequency; frequencies measured in this step and step n must differ by approximately 0.5 MHz for 618C; 1.5 MHz for 620B.

5-26. UNCALIBRATED RF OUTPUT CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-1 but connect Thermistor Mount input to RF OUTPUTS UNCAL connector.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . CW

c. (620B.) Adjustignal Generator frequency control from 3.8 to 7.6 GHz; Power meter should indicate 0.3 mW minimum over frequency range.

c. (620B.) Adjust Signal Generator frequency control from 7 to 11 GHz; Power meter should indicate 0.3 mW minimum over frequency range.

5-27. INTERNAL PULSE-MODULATION CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-3.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . INT
SYNC SELECTOR X1
PULSE RATE 40

c. Electronic Counter should indicate 40 ± 0 Hz.

d. Adjust PULSE RATE control to 400; counter should indicate 400 ±100 Hz.

e. Set SYNC SELECTOR to X10; counter should indicate 4000 ± 400 Hz.

f. Adjust PULSE RATE control to 40: counter should indicate 400 ± 40 Hz.

g. Adjust PULSE WIDTH control from extreme ccw to cw position and observe Oscilloscope; width of pulses should vary from 0.5 to 10 µs (50% points). Pulse width error should not exceed ±1 µs from 1 through 5 and ±20% from 6 through 10.

5-28. INTERNAL SQUARE-WAVE MODULATION CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-3.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . ⊓⊔
SYNC SELECTOR X1
PULSE RATE 40

c. Electronic Counter should indicate 40 ± 4 Hz and Oscilloscope should indicate symmetrical square wave.

d. Adjust PULSE RATE control to 400; counter should indicate 400 ± 40 Hz.

e. Set SYNC SELECTOR to X10; counter should indicate 4000 ± 400 Hz.

f. Adjust PULSE RATE control to 40; counter should indicate 400 ± 40 Hz.

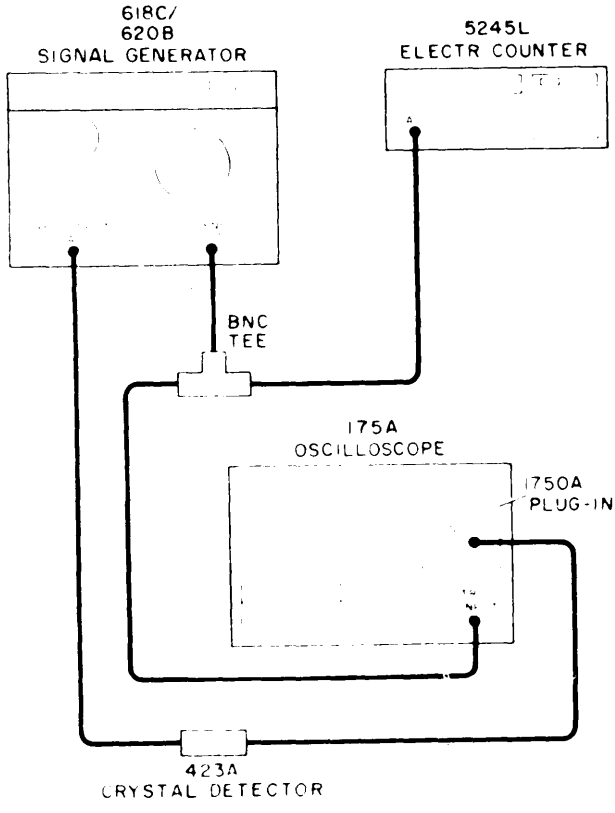


Figure 5-3. Setup for Testing Internal Pulse Modulation.

5-29. EXTERNAL PULSE CHECK.

Connect Signal Generator in test setup shown in Figure 5-4.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . +EXT
POWER SET . . . . . 0 dB
OUTPUT ATTEN . . . . . 0 dB

c. Adjust Pulse Generator for a +20V peak, 1000-Hz output with a pulse width of 0.5 µs.

d. Observe Oscilloscope for 1000-HZ, 0.5-µs pulses at 100% modulation.

e. Adjust Pulse Generator for a +70 V peak output; Oscilloscope should indicate 100% modulation.

f. Adjust Pulse Generator for an output pulse width of 2500 µs.

g. Observe Oscilloscope for 1000-HZ, 2500-µs pulses at 100% modulation.

h. Adjust Pulse Generator output to +20V peak; Oscilloscope should indicate 100% modulation.

i. Set MOD. SELECTOR to -EXT.

j. Repeat steps c through h with pulse generator adjusted to negative pulse output.

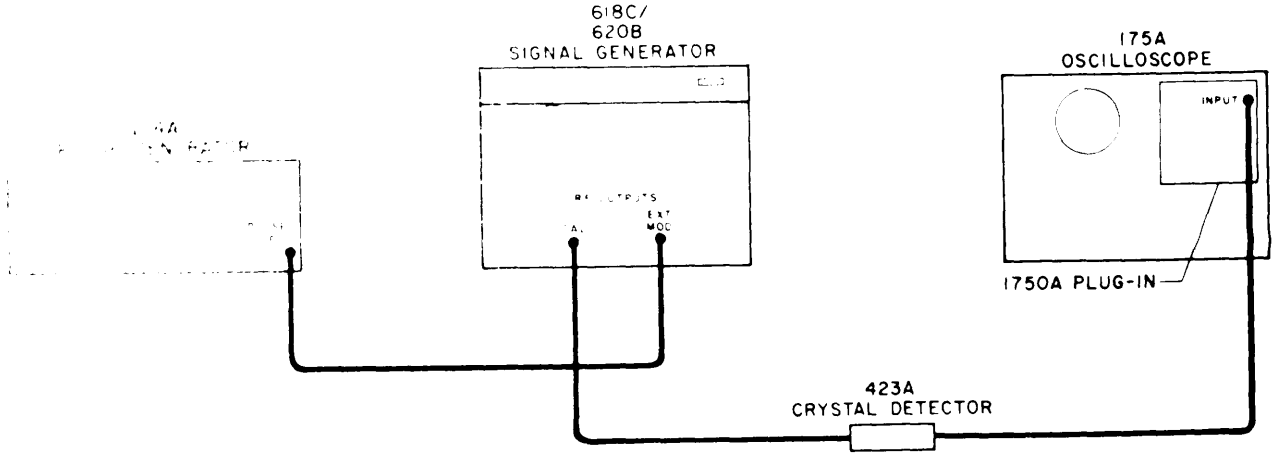


Figure 5-4. Setup for Testing External Pulse Modulation.

5-30. INTERNAL FM CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-5 without the oscillator in the setup.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . INT. FM
Frequency (618C) . . . . . 5 GHz
Frequency (620B) . . . . . 7 GHz
POWER SET . . . . . 0 dBm
OUTPUT ATTEN . . . . . 0 dBm
SYNC SELECTOR X10
PULSE RATE (1000 pps) 100
FM AMPLITUDE . . . . . max ccw

c. Advance FM amplitude control in clockwise direction until the display indicates maximum FM deviation without unstable operation. FM deviation should be 5 MHz p-p minimum.

d. Repeat step c at desired frequencies. FM deviation should be 5 MHz minimum over most of band.

e. Set SYNC SELECTOR to X10.

f. Set PULSE RATE control 50.

g. Repeat steps c and d.

5-31. EXTERNAL FM CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-5.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . EXT. FM
Frequency (618C) . . . . . 5 GHz
Frequency (620B) . . . . . 7.0 GHZ
POWER SET . . . . . 0 dBm
OUTPUT ATTEN . . . . . 0 dBm
FM AMPLITUDE . . . . . max ccw

c. Adjust Oscillator output for maximum at 1000 Hz.

d. Advance FM AMPLITUDE control in clockwise direction until display indicates maximum FM deviation without unstable operation. FM deviation should be 5 MHz minimum.

e. Repeat step d at desired frequencies. FM deviation should be 5 MHz p-p minimum over most of band.

f. Decrease oscillator output and observe FM deviation: FM deviation should decrease proportionally.

5-32. EXTERNAL SINE-WAVE SYNCRONIZATION CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-6.

b. Set Signal Genrator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . INT
POWER SET . . . . . 0 dB
OUTPUT ATTEN . . . . . 0 dB
SYNC SELECTOR . . . . . .

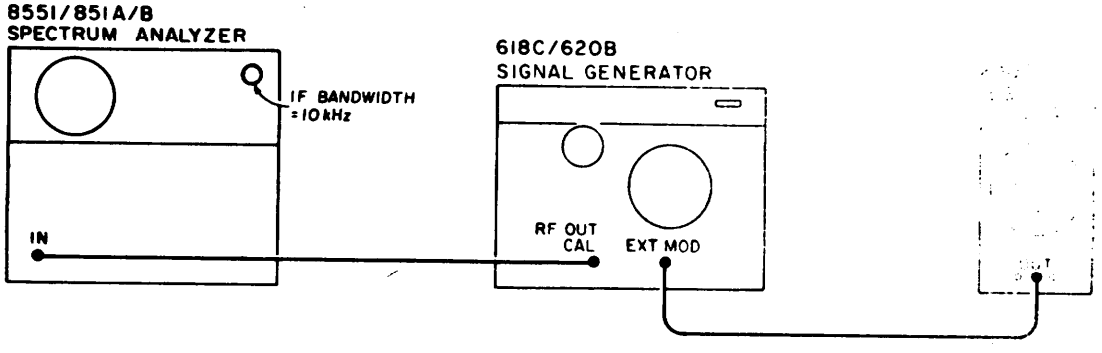


Figure 5-5. Setup for Testing Internal and External FM.

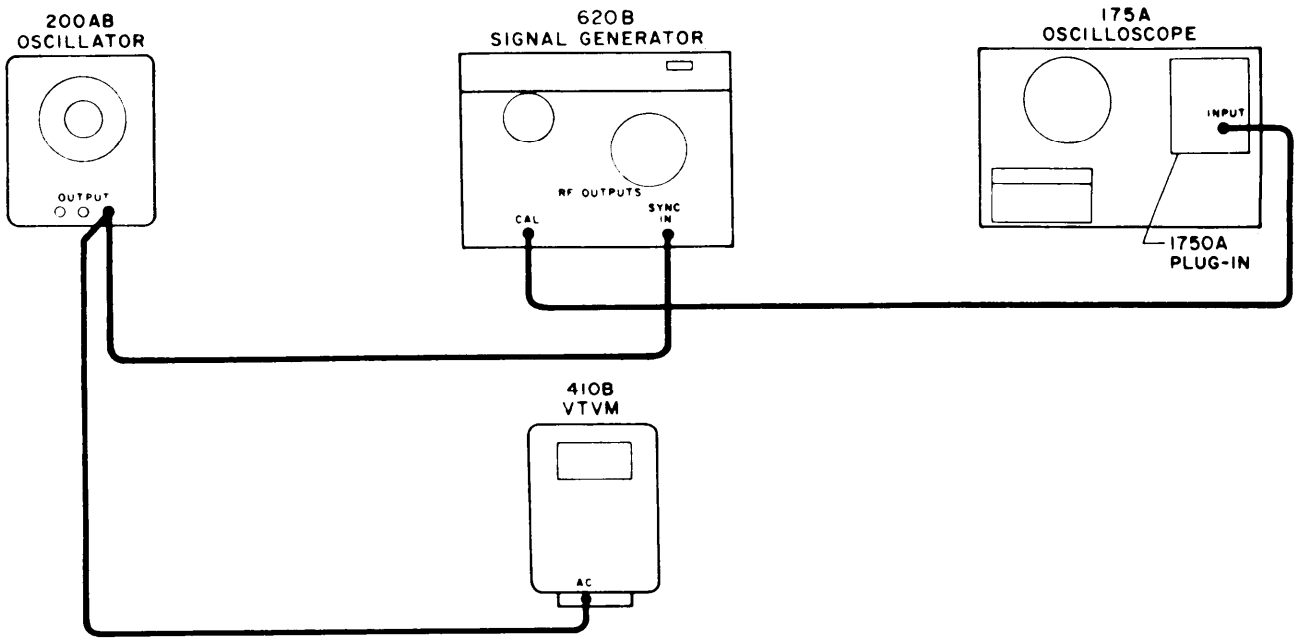


Figure 5-6. Setup for Testing External Sine-Wave Synchronization.

c. Adjust Oscillator for 40-Hz, 5 V rms input to Signal Generator.

d. Observe Oscilloscope for 40-Hz pulses.

e. Adjust Oscillator for 4000-Hz output; observe Oscilloscope for 4000-Hz pulses.

5-33. EXTERNAL PULSE SYNCHRONIZATION CHECK.

a. Connect Signal Generator in test setup shown in Figure 5-6, but replace Oscillator with Model 214A Pulse Generator.

b. Set Signal Generator controls as follows:

POWER, ... ON
MOD. SELECTOR . . . . . INT
POWER SET . . . . . 0 dB
OUTPUT ATTEN . . . . . 0 dB
SYNC SELECTOR . . . . . EXT+

c. Adjust Pulse Generator for 10-HZ, +5 V peak output with a pulse width of 0.5 µs.

d. Observe Oscilloscope for 10-HZ pulses.

e. Adjust Pulse Generator for +50 V peak output; repeat step d.

f. Adjust Pulse Generator for 5-µs pulse width; repeat step d.

g. Adjust Pulse Generator for 4,000-Hz output,

h. Observe Oscilloscope for 4000-Hz pulses.

i. Adjust Pulse Generator for 5 V output; repeat step h.

j. Adjust Pulse Generator for 0.5-µs pulse width; repeat step h.

k. Set SYNC SELECTOR to EXT-

m. Repeat steps c through j using negative pulses.

5-34. ADJUSTMENTS.

5-35. TEST EQUIPMENT REQUIRED.

5-36. Test instruments required to perform the adjustments are listed in Table 5-2. Instruments other than those listed may be used provided their specifications equal or exceed the Critical Specifications.

5-37. POWER-SUPPLY VOLTAGE ADJUSTMENTS.

5-38. There are two adjustable voltages: -700 (-1000V supply) and -500 (-1550 V supply) V. Adjust these voltages only if proven by accurate measurement to be outside the tolerances specified below. Adjust the output voltage of the -700 V regulator first and then adjust the -500 V regulator. After adjusting any regulator, check the output voltage of the other regulators to ensure they are within specified tolerances.

a. Connect an adjustable transformer to control Signal Generator line voltage.

b. Set Signal Generator controls as follows:

POWER . . . . . ON
MOD. SELECTOR . . . . . CW
POWER SET . . . . . 0 dB
Frequency (618C) . . . . . 7.6 GHz
Frequency (620B) . . . . . 11 GHz

Table 5-2. Test Equipment Required for Calibration and Troubleshooting

Test Instrument	Critical Specifications	Recommended Model
All instruments listed in Table 5-1		
Electronic Voltmeter	Range: 0 to 1550 volts Accuracy: ±2%	hp 410C
Clip-On DC Milliammeter	Range: 0.1 mA to 10 amperes Accuracy: ±3% of full scale ±0.1 mA	hp 428B
Frequency Meter	Frequency range: 3.8 to 7.6 GHz (618C) Accuracy: ±0.1%	hp 536A, G532A, and J532A
	Frequency range: 7 to 11 GHz (620B) Accuracy: ±0.1%	hp 532A and X532B
Function Generator	Frequency range: 0.008 to 1200 Hz Output voltage: .30 volts peak	hp 202A

c. Adjust Transformer for 115 (or 230) V.

d. Connect Electronic Voltmeter to test jack J6 (+) and ground (-).

e. Adjust potentiometer R412 (Figure 5-7) for -1000 ±20 volts. Line voltage regulation (115 V ±10%) should hold the -1000 V supply to within ±5V; ripple should be less than 7 mV, p-p. The -300 V supply should track the -1000 V supply to -300 +10 V. Line voltage regulation (115 V ±10%) should hold the -300 V supply to within ±5 V; ripple should be less than 10 mV, p-p.

f. Connect Electronic Voltmeter to test jack J5 (+) and ground (-).

g. Adjust potentiometer R512 (Figure 5-7) for -1550 ±20 V. Line voltage regulation (115 V ±10%) should hold the -1550 V supply to within ±5 V; ripple should be less than 15 mV, p-p.

5-39. ADJUSTMENTS FOLLOWING REPLACEMENT OF KLYSTRON V114 (618C).

5-40. Following replacement of V114, it is important that certain adjustments be made as soon as the Signal Generator is turned on. The following procedure is recommended.

a. With the signal generator removed from the cabinet and with MOD. SELECTOR on OFF, turn on signal generator.

b. Check the -300, -700, and -500 volt supplies (see paragraph 5-37).

c. With the MOD. SELECTOR set to CW, adjust R705 (Figure 5-8) for a klystron cathode current of 25 mA maximum (approximately 15 mA).

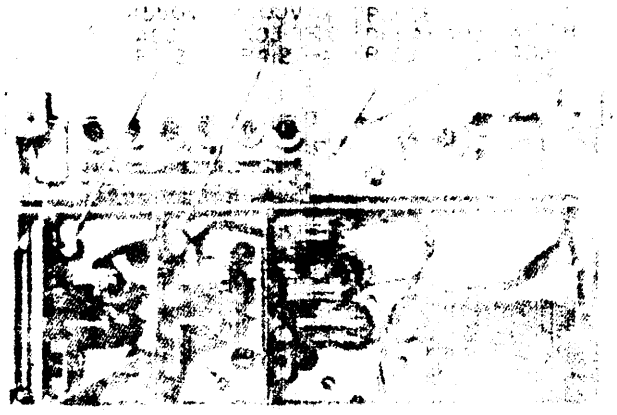


Figure 5-7. Location of Power Supply and Modulator Adjustments.

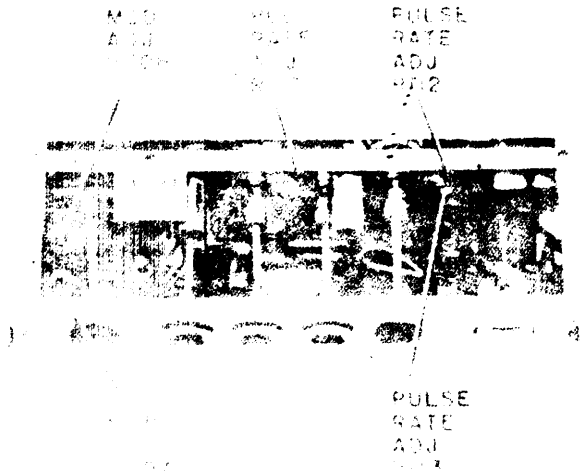


Figure 5-8. Location of Klystron and Modulator Adjustments (618C).

Note

A new klystron tube should now operate at least partially over the frequency range with original repeller voltage settings and for the most part, will require only 1/8 turn to bring the repeller voltage to optimum.

d. Connect instrument as shown in Figure 5-9.

e. Set MOD. SELECTOR to INT. (SYNC SELECTOR to X10). Tune frequency control to 7.6 GHz.

f. Adjust R170 for optimum pulse shape.

g. At this point it is advisable to check the dial calibration at the high end stop. This check avoids possible retracing adjustments when the dial calibration is adjusted later. To conduct the check, tune frequency control to high end stop and place wavemeter in circuit as shown in Figure 5-9. Wavemeter should indicate 7.650 GHz. When the wavemeter is tuned to the actual frequency of the generator a slight decrease in the peak level of the pulse appears on the scale. If this frequency is more than 25 MHz away from 7.650 GHz perform step d in paragraph 5-42.

h. Remove wavemeter and reconnect output cable as shown in Figure 5-9. Tune the frequency control toward 5 GHz, adjusting R170 (Figure 5-10) for best pulse shape between 7.6 and 5 GHz.

i. Tune the frequency control between 5 and 4.2 GHz; adjust R173 and/or R178 (Figure 5-10) for optimum pulse shape.

j. Continue tracking the dial downward toward 3.8 GHz, adjusting R175 for optimum pulse.

k. Tune the frequency control back toward 7.6 GHz observing the pulse shape on the oscilloscope. Readjust the appropriate reflector tracking potentiometer for optimum pulse shape.

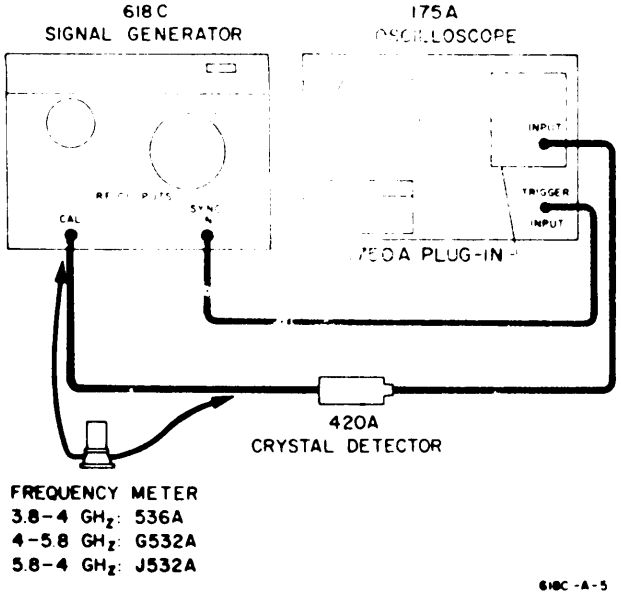


Figure 5-9. Setup for Frequency Dial Calibration (618C).

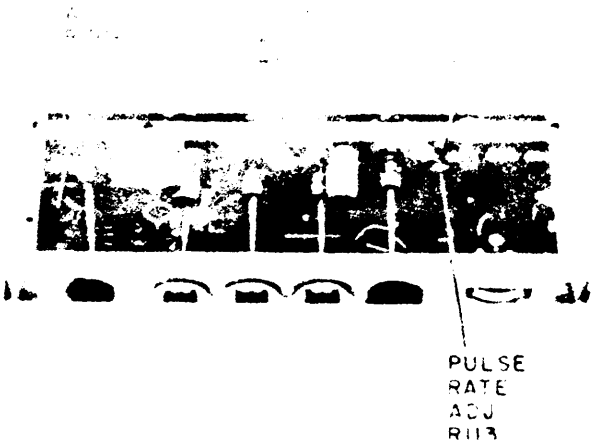


Figure 5-10. Location of Klystron and Modulator Adjustments (620B).

m. If pulse misfiring or jitter occurs at any point in the band which cannot be corrected by adjustment of the reflector tracking potentiometers, adjust R706 for frequencies above the microswitch operation and R707 for frequencies below the microswitch operation.

n. Set the MOD. SELECTOR to SQ. WAVE and observe the waveshape across the band. The waveshape may be improved by repeating the adjustment of R706 and R707 as outlined in step m preceding.

p. Check frequency dial calibration as described in paragraph 5-43.

5-41. ADJUSTMENTS FOLLOWING REPLACEMENT Of KLYSTRON V114 (620B).

5-42. Following replacement of V114, it is important that certain adjustments be made as soon as the signal generator is turned on. The following procedure is recommended.

a. With Signal Generator removed from cabinet set MOD. SELECTOR to OFF and turn on instrument.

b. Check -300, -700 and -500 V supplies, and klystron cutoff bias. Refer to Paragraph 5-37 for power supply adjustments.

c. Adjust frequency control to 10 GHz.

d. Set MOD. SELECTOR to CW and measure klystron beam current with 428A Clip-on DC Milliammeter. Adjust potentiometer R706 (Figure 5-10) for 22-mA klystron beam current.

e. Adjust POWER SET control to obtain up-scale indication on the power set meter. If necessary, adjust potentiometer R170 (Figure 5-11) to obtain proper meter indication. Recheck klystron beam current (25 ma maximum).

f. Adjust Signal Generator to a frequency just above the point where the microswitch is actuated (approximately 8.8 GHz).

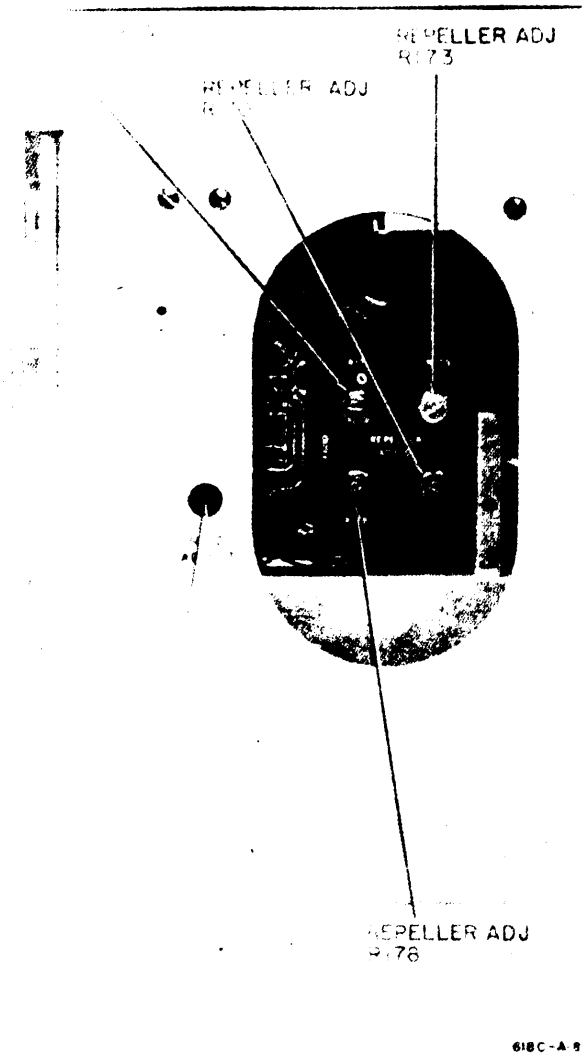


Figure 5-11. Location of Tracking and Power-Set Meter Adjustments.

g. Connect Signal Generator in test setup shown in Figure 5-12.

h. Set MOD. SELECTOR to EXT FM and observe repeller mode pattern on Oscilloscope. Adjust OUTPUT ATTEN and external modulating voltage to obtain the desired vertical deflection on Oscilloscope. Adjust FM AMPLITUDE control to obtain humped waveform shown in Figure 5-12. If necessary adjust the phase of repeller mode pattern.

i. Adjust Signal Generator across entire band while observing the repeller mode pattern on Oscilloscope. If the RF power level drops abruptly (in general, between 8.4 and 8.7 GHz), proceed as follows:

(1) Turn off Instrument.

(2) Loosen klystron mounting nut.

(3) Rotate klystron slightly and make sure klystron is seated properly against shoulder in collet.

(4) Tighten klystron mounting nut by hand.

(5) Check to be sure that the repeller cable is not twisted and makes firm connection to repeller.

(6) Turn on Instrument and observe repeller mode patterns on oscilloscope.

Repeat steps (1) through (6) preceding, rotating klystron slightly each time until the optimum repeller mode pattern is obtained across entire band.

j. Turn off Instrument. Set frequency dial at high-frequency stop and tighten klystron mounting nut.

k. Install tube socket housing with cable entrance towards rear of instrument. Replace four screws.

m. Turn on Signal Generator.

n. Measure Signal Generator output frequency with Frequency Meter. If the measured frequency is below 11.1 GHz, remove bottom plate from frequency drive mechanism and perform (1) through (4) following; if not, perform (5) through (9) following:

(1) Loosen plunger cap screw (Figure 5-13).

(2) Adjust Frequency Meter to 11.1 GHz.

(3) Gently tap rear of plunger until Frequency Meter dip is centered on mode pattern.

(4) Tighten plunger cap screw and replace bottom plate.

(5) Set Frequency Meter to 11.1 GHz.

(6) Adjust frequency dial until Frequency Meter pattern is centered on the mode pattern.

(7) Loosen plunger cap screw.

(8) Turn frequency dial to high frequency stop while holding plunger stationary.

(9) Tighten plunger cap screw and replace bottom plate.

p. Tune Signal Generator across entire band and center repeller mode pattern with repeller tracking potentiometer R170, R173, R175, and R178 (Figure 5-9). Figure 5-12 (A and C) shows two typical mode patterns. Figure 5-12A shows a symmetrical mode pattern that is properly centered by the correct repeller voltage; Figure 5-12B shows the same pattern set off-center by incorrect setting of repeller voltage. Adjust potentiometer R170 and R178 (Figure 5-11) to obtain correct repeller voltage tracking between 11 GHz and the frequency just above the point where the microswitch is actuated (approximately 8.7 to 9 GHz). Adjust potentiometers R173 and R175 (Figure 5-11) to obtain correct repeller voltage tracking between the frequency just below the point where the microswitch is actuated (approximately 8.6 GHz) and 7 GHz.

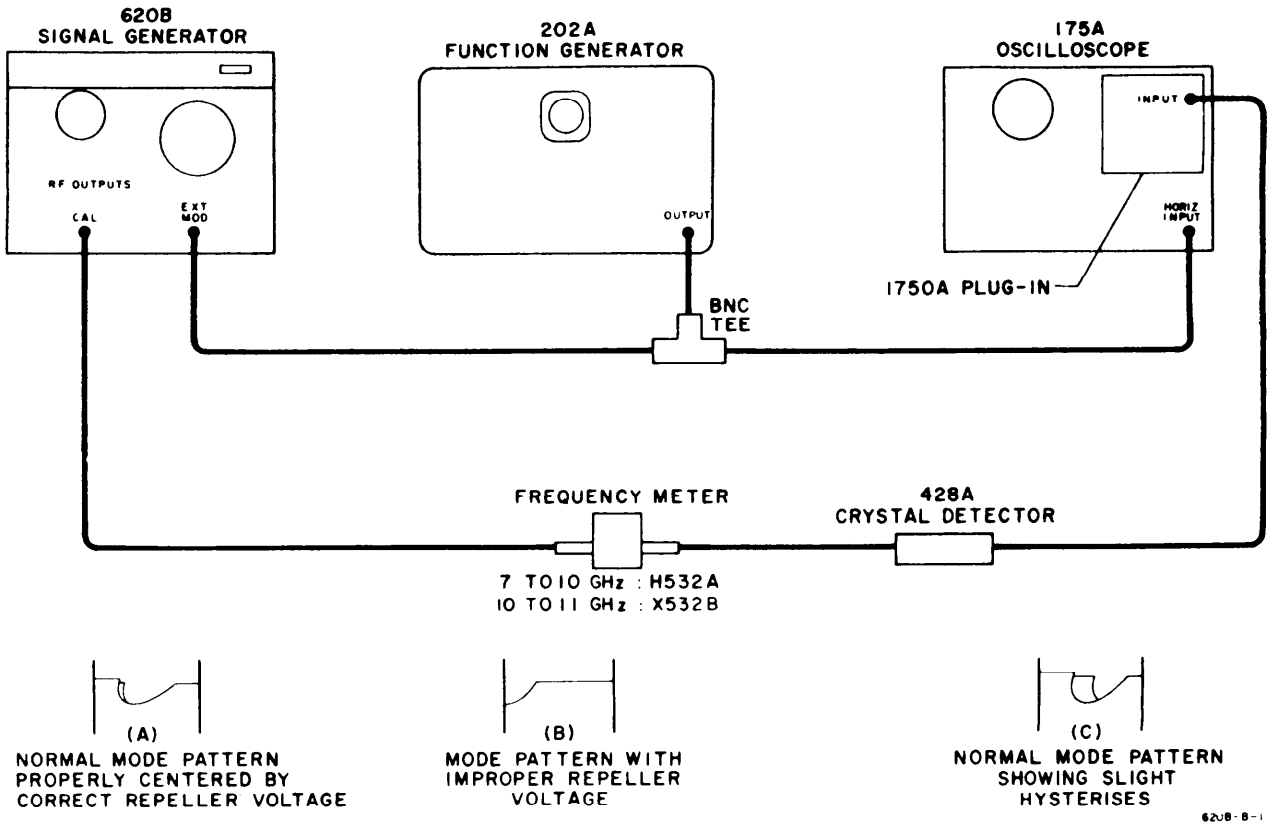


Figure 5-12. Test Setup for Klystron Adjustment (620B).

q. Check Signal Generator output using square-wave and pulse operations over the entire frequency band. If the shape of waveform deteriorates, readjust the appropriate repeller tracking control at the frequency where instability appears.

r. Recheck the entire frequency band and make any minor refinements which may be necessary for best overall operation; that is, stable CW, square-wave, and pulse operation with specified power output over the full frequency range.

5-430 CALIBRATING THE FREQUENCY DIAL (618C).

5-44. Replacing the klystron will usually reduce the accuracy of the megacycles dial by several percent from its rated accuracy of 1%. Inaccuracy of frequency dial calibration is important, the following procedure can be used to restore accuracy. This procedure requires a wavemeter covering the frequency range or a frequency standard setup. In general when anew klystron oscillator tube is installed it will be necessary to slip the frequency dial slightly to bring into calibration. In some cases, it may also be necessary to reset the plunger depth at the high frequency end of the band to reestablish the correct high frequency limit. There are no trimmers or other adjustment; all adjustments for frequency recalibration must be done mechanically. To recalibrate the frequency dial following a change in klystron oscillator tube, proceed as follows:

a. Set MOD. SELECTOR switch to CW. The equipment should be allowed a warm-up of at least 20 minutes before checking calibration.

b. Tune signal generator to 7.650 GHz.

c. Measure output frequency with wavemeter. If reading of MHz dial is in error by more than approximately 100 MHz, it will be necessary to remove plate that covers frequency drive assembly.

d. With MHz dial still set at 7.650 GHz, loosen set screws holding resonator plunger rods in approximately 1/32 inch steps until output frequency is approximately 7.650 GHz as indicated by wavemeter. Tighten set screws in drive bar in this position.

e. Tune Signal Generator to 7.5 GHz. Measure output frequency with wave meter. If output frequency does not agree with dial within 1%, adjust the frequency dial slightly by slipping it on its shaft.

f. Check calibration of MHz dial through range of generator, using a microwave standard and suitable detector. If accuracy at lower frequencies is outside 1% tolerance, the dial can be slipped slightly on its shaft to obtain desired accuracy at lower frequencies.

g. It may not be possible to achieve 1% overall accuracy with some replacement klystrons. In this case try another klystron and repeat procedure.

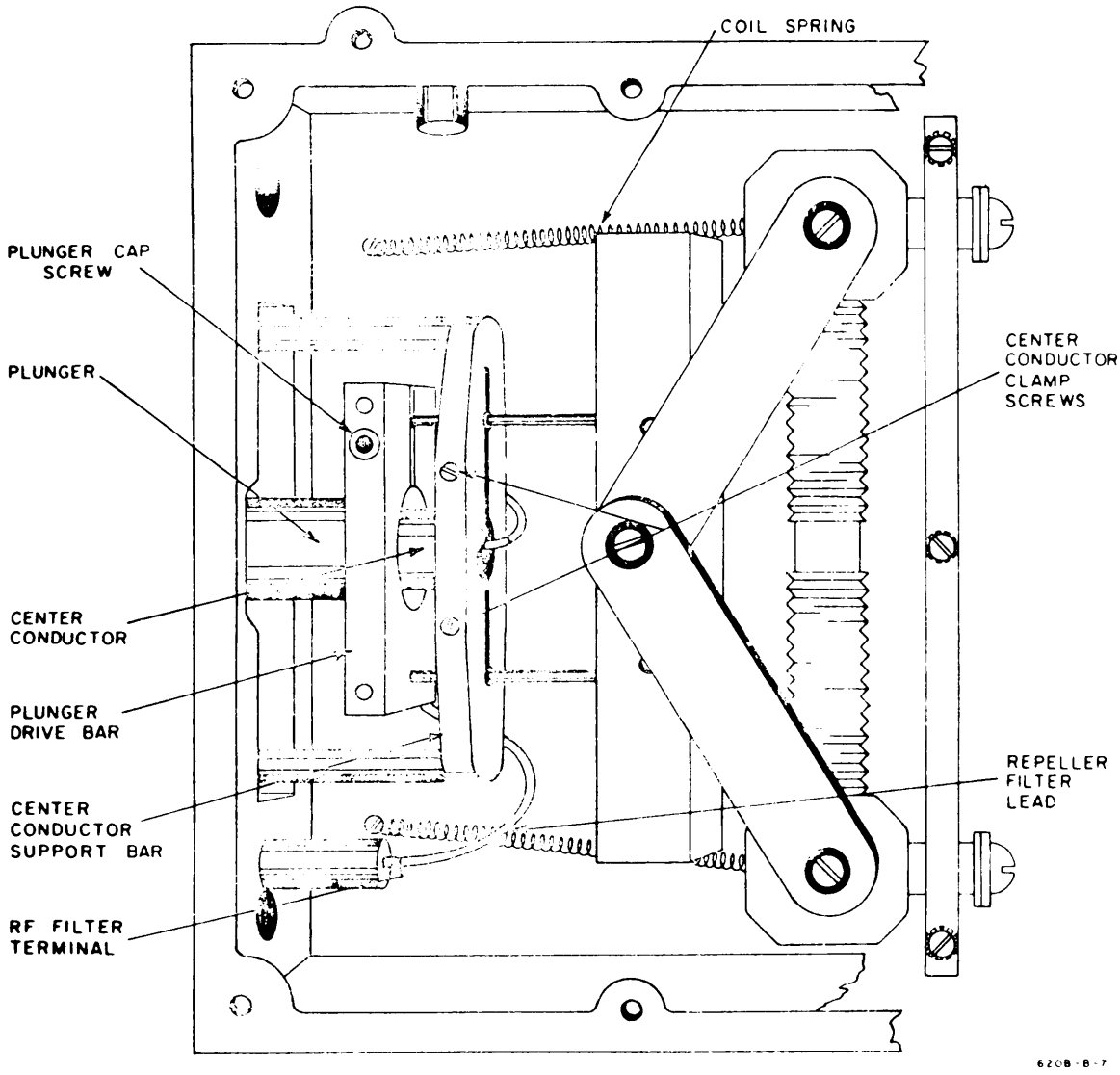


Figure 5-13. Frequency Drive Mechanism, Cover Plate Removed (620B).

5-45. CALIBRATING THE FREQUENCY DIAL (620B).

5-46. Replacing the klystron will usually reduce the accuracy of the frequency dial by several percent from its rated accuracy of 1%. Inaccuracy of frequency dial calibration is important, the following procedure can be used to restore accuracy. In general, when a new klystron oscillator tube is installed it is necessary to slip the frequency dial slightly to bring it into calibration. In some cases, it may also be necessary to re-set the plunger depth to re-establish the correct high-frequency limit. All adjustments for frequency recalibration must be done mechanically. To recalibrate the frequency dial following a klystron change proceed as follows:

a. Following initial voltage adjustments (paragraph 5-42, set MOD. SELECTOR to CW and allow Signal generator to warm up for 20 minutes.

b. Assuming that the repeller adjustments have been set for best operation of the new klystron, tune Signal Generator to the highest frequency at which the klystron will oscillate; measure this frequency with a Frequency Meter.

c. If the klystron cannot be made to oscillate up to 11 GHz, refer to the troubleshooting procedures.

d. If the klystron oscillates satisfactorily up to 11.1 GHz, check the frequency-dial calibration accuracy over the full frequency range. If the dial calibration is too high or too low over the entire range by a nearly equal amount, the frequency dial maybe slipped into calibration by removing the frequency dial cover, loosening the dial hub, and turning the dial a small amount.

e. If slipping the dial will not bring both the high and low ends of the frequency dial into calibration, the high end can first be correctly set by altering the depth of the cavity plunger slightly to obtain the correct upper frequency limit and then slip the dial to bring the low frequency end into calibration.

f. To set the high-frequency limit of the klystron by shifting the plunger setting, remove the bottom plate from the frequency-drive casting to expose the plunger mechanism.

g. Adjust the signal generator to produce 11 GHz as read on the Frequency Meter.

h. Refer to Figure 5-13 and loosen the cap screw holding the plunger in the plunger-drive bar.

i. Holding the plunger in the 11 GHz position, adjust the frequency drive for a reading of 11 GHz on the dial. Tighten cap screw.

j. If oscillation stops when the plunger is moved, readjust the appropriate repeller voltage potentiometer to regain oscillation.

k. Recheck low end of frequency range noting frequency dial accuracy. If dial is inaccurate, remove dial cover, loosen hub slightly and slip frequency dial to correct indication.

m. Recheck accuracy of frequency dial at main points across the band. Refine the foregoing adjustments to produce the best overall accuracy.

n. If the frequency spread of a new klystron tube is much greater or less than that of the original tube, it may not be possible to use the original dial for the new tube. In this case, another klystron must be tried or a new frequency dial must be calibrated.

5-47. CALIBRATING THE PULSE RATE CONTROL.

5-48. Replacing Tube V103 or associated components may lessen the accuracy of the PULSE RATE control but will not otherwise affect the performance of the Signal Generator. It should be noted, however, that the calibration of this dial is only approximate. To calibrate the PULSE RATE dial, proceed as follows:

a. Set Signal Generator controls as follows:

MOD. SELECTOR . . . . . INT.
PULSE WIDTH . . . . . max cw
PULSE DE LAY . . . . . max ccw
PULSE RATE . . . . . max ccw
SYNC SELECTOR X10

b. Connect Electronic Counter to SYNC OUT connector.

c. Adjust potentiometer R112 (Figure 5-8) so that the counter indicates 4800 Hz.

d. Set SYNC SELECTOR to X1.

e. Adjust potentiometer R113 (Figure 5-8) so that counter indicates 480 Hz.

f. Set PULSE RATE fully ccw.

g. Adjust potentiometer R117 (Figure 5-8) so that counter indicates 30 Hz.

h. Adjust PULSE RATE control for a counter reading of 200 Hz.

i. Loosen PULSE RATE dial and adjust to a reading of 200.

5-49. CALIBRATING THE PULSE DELAY CONTROL.

5-50. Replacing tube V107 may degrade the accuracy of the PULSE DELAY Control. After replacing V107, the following procedure can be used to adjust the delay calibration. It should be noted, however, that the calibration of the PULSE DELAY dial is intended only to be approximate.

a. Connect the DELAY SYNC OUT terminal to an oscilloscope vertical input.

b. Synchronize the Oscilloscope with signal at SYNC OUT connector.

c. Set PULSE DELAY control to 300 µs.

d. Adjust potentiometer R133 (Figure 5-7) to give a delay of 300 µs as measured on the calibrated Oscilloscope.

e. Set PULSE DELAY control to 50 µs as indicated by Oscilloscope. (The delay is indicated by the interval between the start of the Oscilloscope trace and the leading edge of the delayed sync pulse.) If necessary, slip the PULSE DELAY dial on its shaft to make calibration accurate.

5-51. CALIBRATING THE PULSE WIDTH CONTROL.

5-52. Replacing Tube V111 may lessen the accuracy of the PULSE WIDTH Control. This control is intended to be accurate within 20% or 1 µs, whichever is greater. To calibrate the PULSE WIDTH control, proceed as follows:

a. Connect RF OUTPUTS UNCAL through a Crystal Detector to vertical input of an Oscilloscope

b. Synchronize Oscilloscope with signal at the SYNC OUT connector.

c. Set PULSE WIDTH control to 10 µs.

d. Adjust potentiometer R156 (Figure 5-7) so that width of pulse of 10 µs as measured on the Oscilloscope.

e. Set the PULSE WIDTH control to 2-µs pulse width on Oscilloscope.

f. If necessary, slip dial to read 2 microseconds.

g. Repeat steps c through f for best overall calibration accuracy.

Note

The width of RF pulse will vary approximately 0.25 µs as the generator is tuned through its RF range. The above adjustments can be made for best accuracy at any desired RF frequency.

5-53. POWER SET METER ADJUSTMENTS.

5-54. MECHANICAL ZERO. Adjust mechanical zero as follows:

a. Remove instrument cover for access to the meter. Lift the white paper sticker that covers the zero adjust. Be sure to replace it when through.

b. Connect shorting lead across meter terminals.

c. With a non-metallic tool, adjust mechanical zero-adjust screw until meter pointer is at left of meter zero and moving towards meter zero; stop adjustment when meter pointer is exactly at zero.

d. Carefully adjust mechanical zero-adjust screw a few degrees to free screw from meter suspension. If pointer moves off zero, repeat step c.

e. Remove shorting lead from meter terminals and replace instrument cover.

5-55. ELECTRICAL ZERO. The electrical zero is set at the factory and requires adjustment only when bolometer circuit components are changed. Adjust as follows:

a. Remove instrument cover for access to R612 (see Figure 5-11).

b. Set MOD. SELECTOR to CW.

c. Adjust POWER SET until meter pointer is about 8 inch to the right of zero (0).

d. Set MOD. SELECTOR to OFF.

e. Adjust zero set control (R612) until meter pointer is at the dot at the left end of the scale. Replace the instrument cover.

5-56. TROUBLESHOOTING.

5-57. TEST EQUIPMENT REQUIRED.

5-58. The test equipment required to troubleshoot the Signal Generator is listed in Table 5-2. Instruments other than those listed may be used provided their specifications equal or exceed the critical specifications.

5-59. ISOLATING A TROUBLE TO A CIRCUIT SECTION.

5-60. The troubleshooting procedures are designed to identify the causes of one or more of the following symptoms:

a. Low or no RF output at RF OUTPUTS CAL.

b. RF output normal but abnormal indication on front-panel power meter.

c. No or low amplitude-modulation level.

d. No or little frequency modulation.

e. Modulation frequency, width, or delay abnormal.

f. Poor or no external synchronization.

5-61. Each of the above troubles first requires isolation to a faulty functional section of the Signal Generator. Regardless of the trouble encountered, the power supply voltages should first be checked (see paragraph 5-37). If a power supply is within 4 or 5% of its nominal value, it should not cause any catastrophic trouble. However, a greater deviation from nominal could be suspected as the cause of a near complete failure of a Signal Generator function. If a voltage value exceeds 4% of its nominal level, the power supply should be repaired prior to troubleshotting the other circuits of the instrument.

5-62. POWER SUPPLY TROUBLESHOOTING. Because the individual power supplies are to some extent interdependent, care must be taken to troubleshoot the supplies in a particular sequence. This sequence is as follows: -300 V supply, -700 V supply, -500 V supply, and the 6.3 V filament supplies.

WARNING

Use extreme care when making the filament voltage measurements. One side of each ac supply is connected to a negative high-voltage source. To measure ac voltage, turn off instrument and discharge high-voltage supplies. If one side of voltmeter power line is grounded to voltmeter, remove the ground. Connect voltmeter to test points and turn on instrument. DO NOT TOUCH METER; CASE IS AT HIGH-VOLTAGE POTENTIAL. After measurement, turn off instrument and discharge high-voltage supplies.

5-63. To isolate a trouble in the -300 V supply, check the -300 V output at test point 2. Excessive ripple is probably due to a failure of capacitor, C360, C361, C362, or C363, or a heater-cathode short in V301-V304. If the -300 V output is nonexistent or very low, check the dc voltage between test points 2 and 13 to establish that the dc input to the regulator is normal. If normal, the regulator circuit composed of V301-V304 and associated parts is faulty. Isolate the faulty tube or part through voltage and resistance checks (Figures 5-21, 5-22), and tube replacement. It should be noted that the regulator circuit comprises a servo (feedback) loop, and hence a failure of any part will be reflected by erroneous voltage indications at most points in the circuit. Resistance readings, however, usually provide an indication of a faulty part.

5-64. It should be established that an excessive load is not being placed on the power supplies, such as a shorted high-voltage decoupling capacitor or shorted tube. Excessive load conditions gives trouble symptoms similar to those encountered in a power supply failure. A Model 428B Ammeter can be used to check the current load on the supplies. Table 5-3 lists the (check points for each supply.

5-65. If the dc voltage input to the regulator circuit is abnormal, check the ac voltage between test points 3 and 4 (see WARNING in paragraph 5-62). If this voltage is normal, voltage-doubler diodes CR301, CR302, or associated filter parts (C360-C362, R361, R362) are faulty. If the ac voltage across test points 3 and 4 is abnormal, transformer T1 or the 115 (or 230) V primary-power circuit is faulty.

Table 5-3. Power-Supply Current Measurements

Test Point*	Current (mA)
Pink lead connected to TB1-5	7 ±1
Red lead connected to TB1-6	2.3 ±0.5
Red lead connected to TB1-7	4.3 ±0.5

*MOD. SELECTOR set to INT PULSE; frequency adjusted to 7.6 GHz (618C); 11 GHz (620B).

Note

The -700 V and -500 V supplies are checked in a manner similar to the -300 V supply, using the particular test points assigned to these supplies. Care must be taken to follow the sequence given in paragraph 5-62.

5-66. NO OR LOW RF OUTPUT. Assuming the power supply to be normal, no or very low RF output could be caused by a faulty RF attenuator probe, or a faulty klystron and associated components. A faulty attenuator probe can be positively identified by adjusting the POWER SET control to obtain a normal indication on the front panel power meter. If the meter indication is normal, the RF attenuator probe is faulty; otherwise the problem is in the klystron or associated circuit parts. The klystron oscillator is best checked by voltage and current measurements. Refer to Figure 5-22 for klystron voltage measurements and paragraphs 5-40 & 5-42 for measurement of klystron beam current. If all measurements are normal, replace the klystron. Abnormal voltage measurements indicate a failure of one or more circuit parts. If an abnormal indication occurs in the klystron repeller circuit, perform resistance measurements to isolate the faulty part. In the klystron grid circuit, perform resistance checks and check modulator tube V701. In the cathode circuit, check diodes CR701 and CR702.

5-67. RF OUTPUT NORMAL BUT RF OUTPUT METER ABNORMAL. This trouble indication is caused by either a faulty power-monitor probe or power meter circuit. A faulty power-monitor probe is detected by removing diode CR603 and measuring the resistance between center conductor and case. Normal indication is 50 ± 5 ohms. If both the probe and detector check normal, perform voltage checks (see Figure 5-22) on transistors Q601 through Q603 to isolate the faulty part in the power meter circuit.

5-68. NO OR LOW AMPLITUDE MODULATION. To identify this type of trouble first establish that the trouble is with all amplitude-modulation modes (internal pulse, external pulse, or internal square wave) or only one of the modes. If all amplitude modulation modes are faulty, Modulator tube V701 or associated circuit parts are probably faulty. This can be checked by performing waveform measurements at test points 14 and 15 (see Figure 5-27). If the abnormal indication is at test point 14 only, check V701 and the plate circuit components. If both test points are abnormal, check V701 and the grid circuit components. Voltage and resistance checks should isolate a faulty part.

5-69. If the trouble involves only internal pulse modulation, the trouble is in MOD. SELECTOR switch S102 or the internal pulse-generating circuits. To isolate the trouble, check the waveforms (Figure 5-27) at test points 22 through 16, (in that order) and refer to the following list of troubles when an abnormal waveform is encountered.

Abnormal Waveform at Test Point	Trouble
22	V102, V103, or associated parts
21	V105 or associated parts
20	S102, deck H; or V106, V107, or associated parts
19	S102, deck F; or V109 or associated parts
18	V108 or associated parts
17	V111 or associated parts
16	S102, deck E

5-70. If only external pulse modulation is faulty, set MOD. SELECTOR to -EXT and check modulation. If normal, inverter V109A is faulty. If abnormal, switch S102 (sections E or G) is faulty, or capacitor C123 or resistor R143 is faulty. The latter two components may be isolated by checking the external modulating signal at test point 23.

5-71. If only square-wave modulation is faulty, perform waveform measurements at test point 22. If normal, switch S102 (deck G) is faulty. If abnormal, V102, V103, or associated parts are faulty.

5-72. NO OR LITTLE FREQUENCY MODULATION. First establish if the trouble is with both external and internal FM. If the trouble is isolated to external FM only, check waveform (Figure 5-27) at test point 23. If waveform at test point 23 is normal, the trouble is in MOD. SELECTOR switch S102, section B or G. If waveform at test point 23 is abnormal, check capacitor C123 and resistor R143. If trouble is with both external and internal FM, perform waveform measurement at test point 24. If waveform at test point 24 is abnormal check capacitor C136 and variable resistor R168. If waveform at test point 24 is normal, perform voltage and resistance measurements (Figures 5-21, 5-22 of the klystron repeller circuit.

5-74. MODULATION FREQUENCY, WIDTH, OR DELAY ABNORMAL. A trouble involving the frequency of internal modulation is caused by Multivibrator V102, V103 and associated parts. Pulse width troubles are caused by a fault in Multivibrator V111 or associated parts. Pulse delay troubles are caused by a fault in Multivibrator V106, V107 or associated parts.

5-75. POOR EXTERNAL SYNCHRONIZATION. A trouble involving the external synchronization is caused by Amplifier and Inverter V101 and associated parts. To isolate a trouble in the external synchronization to a faulty part, perform voltage and resistance measurements (Figures 5-21, 5-22) of V101 and associated circuit.

5-76. ISOLATING TROUBLE IN TRANSISTOR CIRCUITS.

5-77. The following procedures and data are given to aid in determining whether a transistor is operational. Tests are given for both in-circuit and out-of-circuit transistors.

5-78. IN-CIRCUIT TESTING.

5-79. The common causes of transistor failures are internal short- and open-circuits. In transistor circuit testing the most important consideration is the transistor base-emitter junction. Like the control grid of a vacuum tube, this is the operational control point in the transistor. This junction is essentially a solid-state diode. For the transistor to conduct, the diode must conduct; that is, the diode must be forward biased. As with simple diodes, the forward-bias polarity is determined by the materials forming the junction. Use the transistor symbol on the schematic diagram to determine the bias polarity required to forward-bias the base-emitter junction. The A part of Figure 5-14 shows transistor symbols with terminals labeled. Notice that the emitter arrow conventionally points toward the type N material. The other two columns of the illustration compare the biasing required to cause conduction and cut-off in transistors and vacuum tubes. If the transistor base-emitter diode (junction) is forward-biased the transistor conducts. If the diode is heavily forward-biased, the transistor saturates. However, if the base-emitter diode is reverse-biased the transistor is cut-off. The voltage drop across a forward biased emitter-base diode varies with transistor collector current. For example, a germanium transistor has a typical forward-bias, base-emitter voltage of 0.2-0.3 V when collector current is 1-10 mA, and 0.4-0.5 V when collector current is 10-100 mA. In contrast, forward bias voltage for silicon transistors is about twice that for germanium types: about 0.5-0.6 V when collector current is low, and about 0.8-0.9 V when collector current is high.

5-80. Figure 5-14, part B, shows simplified versions of the three basic transistor circuits and gives the operating characteristics of each. When examining a transistor stage, first determine if the emitter-base diode is biased for conduction (forward-biased) by measuring the voltage difference between emitter and base. When using an electronic voltmeter, do not measure directly between emitter and base; there may be sufficient loop current between the voltmeter leads to damage the transistor. Instead, measure to a common point (e.g., chassis). If the emitter-base diode is forward-biased, check for amplifier action by short-circuiting base to emitter while observing collector voltage. The short-circuit eliminates base-emitter bias and should cause the transistor to stop conducting (cut off). Collector voltage should then shift to near the supply voltage. Any difference is due to leakage current through the transistor and, in general, the smaller this current, the better the transistor. If collector voltage does not change, the transistor may have an internal open or short.

5-81. TESTING TRANSISTORS WITH AN OHMMETER.

5-82. The two common causes of transistor failure are internal short- and open-circuits. Remove the transistor from the circuit (caution with heat) and use an ohmmeter to measure internal resistance. See Table 5-4, for measurement data.

CAUTION

Most ohmmeters can supply enough current or voltage to damage a transistor. Before using an ohmmeter to measure transistor forward or reverse resistance, check open-circuit voltage and short-circuit current output ON THE RANGE TO BE USED. Open-circuit voltage must not exceed 1.5 V and short-circuit current must be less than 3 mA. See Table 5-5 for safe resistance ranges for some common ohmmeters.

5-83. KLYSTRON REMOVAL (618C).

5-84. To remove the klystron oscillator tube V114 from the resonant cavity proceed as follows:

a. Remove the socket housing cap, screws and lock washers (items 1 and 2, Figure 5-15). Pull the housing (3) away until the tube socket is exposed.

b. Pull straight back on the socket until it is free of the tube base. Do not apply lateral pressure when removing socket.

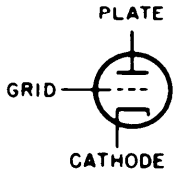
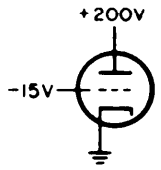
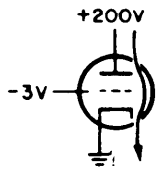
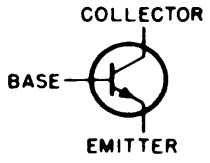
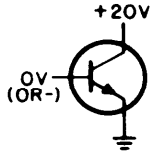
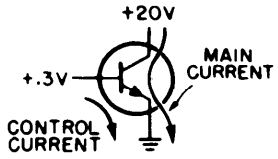
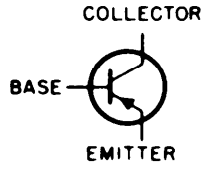
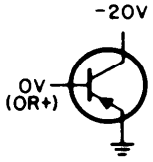
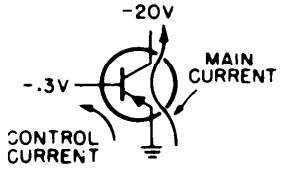
c. Unscrew and remove sleeve (4) which covers klystron body. Do not at any time apply side motion to the klystron; to do so will break the tube.

d. Turn klystron (6) clockwise, and at the same time pull straight back from the cavity. Do not attempt to rock the klystron.

e. Remove clamping ring and rubber washer (5).

f. Unscrew retaining nut (7) at cavity entrance using socket wrench supplied with the instrument. Remove the seating ring (9) and the spring (8) below retaining nut. Do not use this spring or washer again except as a necessity. New springs and washers are supplied with replacement klystrons ordered from Hewlett-Packard Co.

A. TRANSISTOR BIASING

DEVICE	SYMBOL	CUT OFF	CONDUCTING
VACUUM TUBE			
N P N TRANSISTOR			
P N P TRANSISTOR			

B. AMPLIFIER CHARACTERISTICS

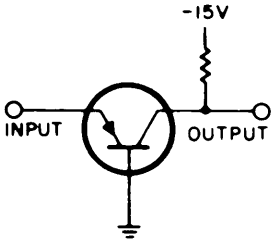
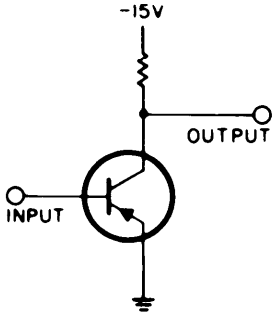
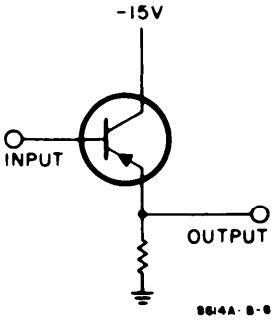
CHARACTERISTIC	COMMON BASE	COMMON EMITTER	COMMON COLLECTOR
INPUT Z	30-50 Ω	500-1500 Ω	20-500K Ω
OUTPUT Z	300-500K Ω	30-50K Ω	50-1000 Ω
VOLTAGE GAIN	500-1500	300-1000	< 1
CURRENT GAIN	< 1	25-50	25-50
POWER GAIN	20-30 db	25-40 db	10-20 db
			

Figure 5-14. Transistor Biasing and Operating Characteristics.

Table 5-4. Out-of-Circuit Transistor Resistance Measurement

Transistor Type		Connect Ohmmeter		Measure Resistance (ohms)
		·s. lead to	Neg. lead to	
PNP Germanium	Small Signal	emitter	base*	200-500
		emitter	collector	10K-100K
	Power	emitter	base*	30-50
		emitter	collector	several hundred
NPN Silicon	Small Signal	base	emitter	1K-3K
		collector	emitter	very high (might read open)
	Power	base	emitter	200-1000
		collector	emitter	high, often greater than 1M

*To test for transistor action, add collector-base short. Measured resistance should decrease.

Table 5-5. Safe Ohmmeter Ranges for Transistor Resistance Measurements

Ohmmeter	Safe Range(s)	Open Ckt Voltage	Short Ckt Current	Lead	
				Color	Polarity
hp 412A	R x 1K R x 10K R x 100K R x 1M R x 10M	1.0V 1.0V 1.0V 1.0V 1.0V	1 mA 100 μA 10 μA 1 μA 0.1 μA	Red Black	+ -
hp 410C	R x 1K R x 10K R x 100K R x 1M R x 10M	1.3V 1.3V 1.3V 1.3V 1.3V	0.57 mA 57 μA 5.7 μA 0.5 μA 0.05 μA	Red Black	+ -
hp 410B	R x 100 R x 1K R x 10K R x 100K R x 1M	1.1V 1.1V 1.1V 1.1V 1.1V	1.1 mA 110 μA 11 μA 1.1 μA 0.11 μA	Black Red	+ -
Simpson 260	R x 100	1.5V	1 mA	Red Black	+ -
Simpson 269	R x 1K	1.5V	0.82 mA	Black Red	+ -
Triplett 630	R x 100 R x 1K	1.5V 1.5V	3.25 mA 325 μA	Varies With Serial Number	
Triplett 310	R x 10 R x 100	1.5V 1.5V	750 μA 75 μA		

g. If sample probe adapter (11) protrudes into the cavity, remove the lock nut (12) and disengage pipe (10). Loosen lock nut (12) and back out adapter (11) until it is flush with the inside face of the cavity bottom plate.

Note

See Klystron Tube Warranty Claim in this manual.

5-85. KLYSTRON REPLACEMENT (618C).

5-86. Prior to installing a new klystron V114, practice reinstalling the old one. The proper force and twist required to push the klystron past the spring may then be learned by practice. The procedure for installing the new klystron is as follows:

a. Install new waffle seating ring (9, Figure 5-15) and then new spring (8) in cavity entrance. Ends of spring should meet to form a complete circle.

b. Thread the retaining nut (7) into cavity until it is seated very lightly against the spring. Press spring into place under the nut so that it forms a circle. Tighten the nut slightly to hold the spring in position.

CAUTION

When inserting the tube, always keep it straight in line with the cavity. DO NOT work it from side to side.

c. Insert the klystron tube (6) into the cavity until it engages the spring (8). Firmly press the tube straight into the cavity at the same time giving it a clockwise twist. The twist will cause the spring to expand and pass the tube allowing it to seat firmly in the cavity.

d. Tighten the retaining nut slightly with socket wrench supplied.

e. Snap the clamping rings (5) making certain that they encircle the grid ring of the klystron. When the rings are in position, three or four threads of the nut (7) should be visible between the clamping rings and the outside face of the nut. Install rubber washer, not shown.

f. Thread the cover sleeve (4) into the retaining nut so that it seats against the clamping rings, causing the clamping ring to grip the grid ring of the klystron. Tighten the sleeve firmly by hand.

g. Install the tube socket and housing (3), pressing the socket straight into position.

h. Position socket housing and attach cap screws (1).

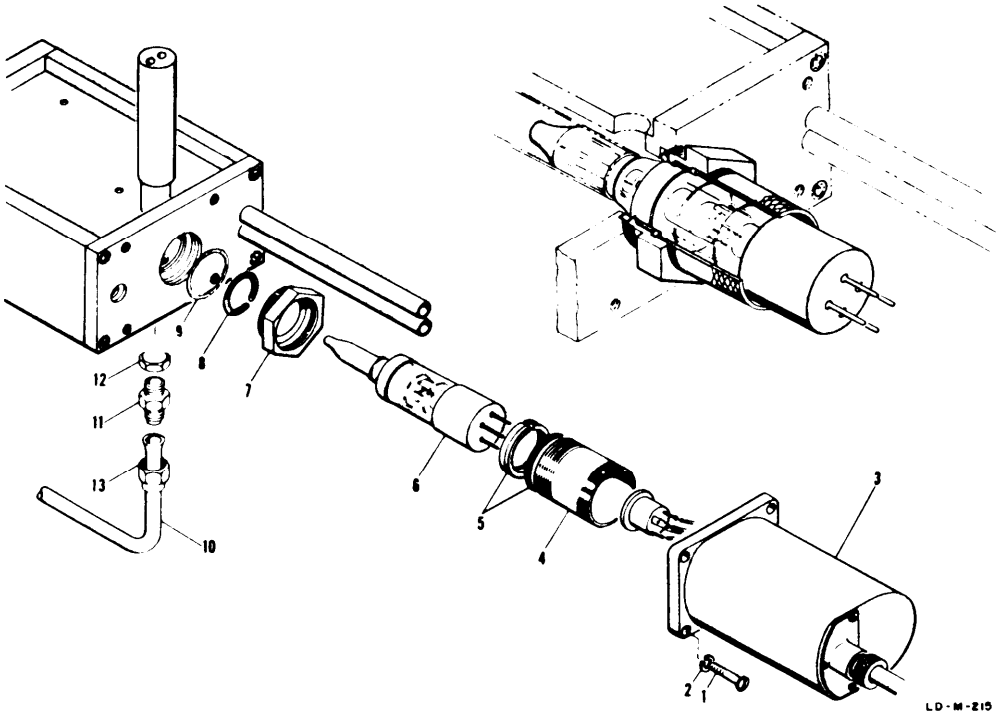


Figure 5-15. Exploded View of Klystron Mounting Parts (618C).

5-87. KLYSTRON REMOVAL (620B).

5-88. To remove the klystron from the resonant cavity, remove the Instrument from the cabinet or rack.

The klystron is located at the left side of the instrument just behind the front panel. Refer to Figure 5-16 and proceed as follows:

CAUTION

Do not at any time apply side pressure to the klystron. To do so will break the tube.

a. Remove the four screws from the klystron tube base cover.

b. Pull tube base cover straight out to expose tube base.

c. Remove socket from klystron. Pull socket straight out to expose tube base.

d. Loosen and remove klystron mounting nut with wrench supplied.

e. Remove collet washer with a sharp tool. Grasp klystron tube base and pull straight out of cavity.

f. Remove clamp spring.

g. If collet ring and collet are locked on klystron, place klystron on its base and gently tap collet ring to free the collet.

Note

See Klystron Tube Warranty Claim at rear of Replaceable Parts.

5-89. KLYSTRON REPLACEMENT (620B).

a. Insert waffle washer in cavity (Figure 5-16). Use new washer if old washer is damaged.

b. Place collet ring and collet spring on collet, making sure taper on ring seats against flare of collet.

c. Place collet washer over collet. Place mounting nut over collet washer.

d. Place klystron assembly into cavity and tighten mounting nut by hand until collet just grips klystron, but klystron should still be free to rotate.

f. Slide klystron out approximately 1/8 inch, then push in until klystron seats firmly against shoulder in collet.

CAUTION

DO NOT USE EXCESSIVE PRESSURE, to prevent possible damage to klystron.

g. Tighten mounting nut by hand, then push socket on klystron base, being careful not to exert any side pressure on the klystron.

h. Remove cover plate from frequency drive mechnism to check repeller cable. Be sure to push the repeller cable into center conductor to connect the repeller before turning on the instrument.

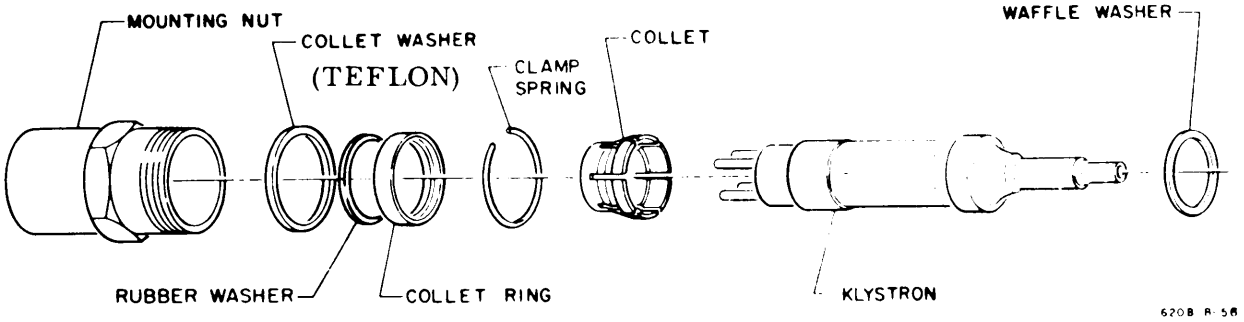


Figure 5-16. Exploded View of Klystron Mounting Parts (620B).

CAUTION

Failure to make repeller connection may cause damage to klystron.

Complete klystron adjustment is given in step a through h of paragraph 5-42.

5-90. REPLACING REPELLER TRACKING POTENTIOMETER.

5-91. To replace the repeller tracking potentiometer, R174, on the frequency drive casting, refer to Figure 5-17 and proceed as follows:

a. Remove the four flat-head screws on each side of the front panel that hold the panel assembly to the side gussets. Pull panel assembly away from chassis to give access to the repeller potentiometer.

b. Remove leads from terminals on potentiometer.

c. Remove Tru-Arc ring and potentiometer rear cover.

d. Loosen only the two setscrews holding potentiometer shaft in the coupler. Do not loosen screws holding coupler to front-panel shaft.

e. Remove the three screws holding the potentiometer to the mounting ring and withdraw potentiometer. Do not loosen screws holding mounting ring to casting.

f. Remove rear cover and place shaft of new potentiometer in coupler. Do not tighten the set screws at this time.

g. Position the new potentiometer with the terminals near the top and replace the three mounting screws and spacers. Position the potentiometer so that shaft does not bind in coupler during any portion of coupler rotation. Tighten mounting screws.

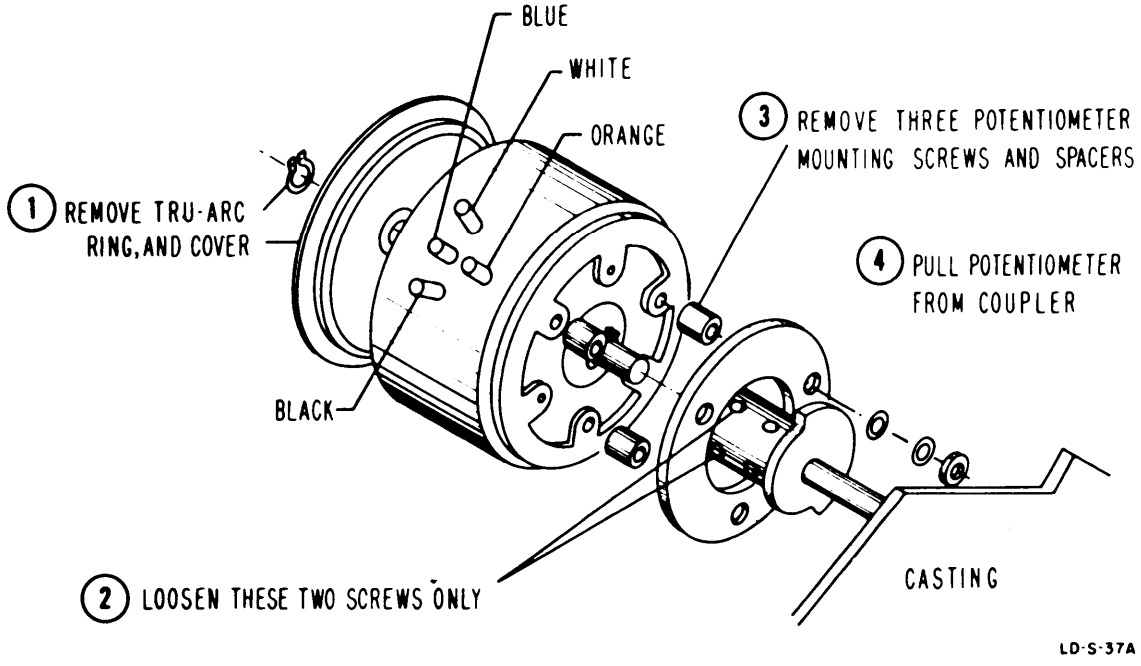


Figure 5-17. Repeller Tracking Potentiometer Removal.

h. With an ohmmeter connected between the orange and blue leads on the potentiometer, turn the frequency control to point where microswitch just operates (approximately 8.9 GHz), so the arm (blue lead) is exactly at the tap in the potentiometer. This point is the lowest resistance reading on ohmmeter.

i. Replace rear potentiometer cover and reconnect leads.

j. Tighten set screws in the coupler.

k. Reset repeller voltage adjustments as described in paragraphs 5-43 and 5-45.

5-92. REPLACING AND RECALIBRATING THE ATTENUATOR (618C).

5-93. It is not expected that the attenuator dial will require recalibration unless the attenuator assembly is replaced. The attenuator is not ordinarily subject to change or breakage. Small improvements in accuracy may be made by slipping the attenuator dial on the front panel slightly on its shaft to bring into calibration.

5-94. Following replacement of the probe, the attenuator assembly must be adjusted for the correct and safe operating depth. The following instructions are divided into two parts: the first concerns the replacement of the attenuator probe, and the second concerns the attenuator dial alignment.

5-95. REPLACING THE ATTENUATOR PROBE (618C).

5-96. Power from the resonator is coupled to the RF OUTPUTS CAL jack at the front panel through an assembly consisting of the panel jack, a length of RG-55 U cable, and the attenuator probe. The attenuator probe is terminated by a special resistor, which is made by coating platinum on a glass bead. This resistor should normally last for the life of the equipment even if subject to shock and vibration. Should the resistor become broken or otherwise defective however, the complete attenuator assembly must be replaced. Replace a defective attenuator assembly as follows:

a. Remove the four screws holding the RF OUTPUTS CAL connector to the front panel.

b. Release attenuator cable from under cable clamp.

c. Remove mounting screw which holds the rack to the aluminum block on the attenuator probe.

d. Lift mounting block and probe from the circular waveguide housing.

e. Use care in handling attenuator probes. The glass bead resistor can be broken by twisting the cable. Mounting block comes affixed to new probe.

f. Insert new probe into waveguide only as far as is necessary to match-up block mounting holes. Insert mounting screw and tighten. Take care that the probe ground is oriented in the right direction (away from the cavity). The glass beads should be visible on the RIGHT HAND SIDE of the ground connection extension when viewing the instrument from the front.

g. Carefully thread cable under cable clamp and around casting to front panel. Avoid twisting cable more than one-quarter turn.

h. Remount RF OUTPUTS CAL connector. Tighten cable clamp.

i. After the assembly is replaced, an error of a few decibels may exist in the calibration of the attenuator dial.

5-97. RECALIBRATING THE ATTENUATOR (618C).

a. Connect signal generator in test setup shown in Figure 5-1.

b. Turn signal generator on and allow a 20-minute warm up period with modulation selector switch in CW position.

c. Turn modulation selector switch to OFF position, adjust zero set controls in generator and power meter to zero, and return selector switch to CW position. To prevent drift due to temperature change make these adjustments as quickly as possible.

d. Tune signal generator to 3.8 GHz and adjust POWER SET control for zero dBm indication on power set meter.

e. Adjust thermistor mount for maximum reading on power meter with generator output attenuator set to 7 (-7 dBm). Record frequency and external power meter reading.

f. Repeat step e every 200 MHz across entire frequency range.

g. Plot a dBm-frequency curve from readings obtained in step f (see Figure 5-18). Resulting response curve will consist of a series of peaks and troughs having an amplitude of ±1.25 dB or less. Draw a straight line (parallel to frequency axis) through response curve in such a way that variations are averaged about the line.

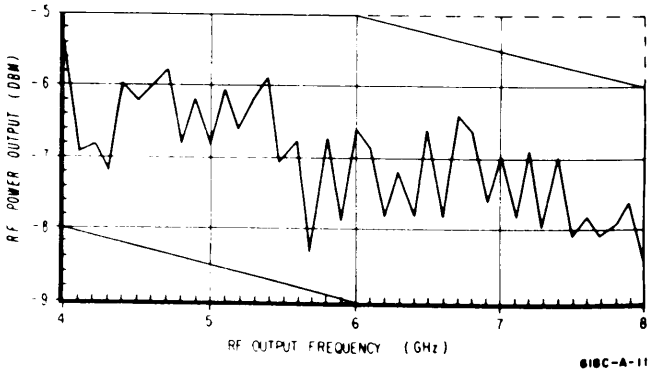


Figure 5-18. Typical Response Curve (618C)

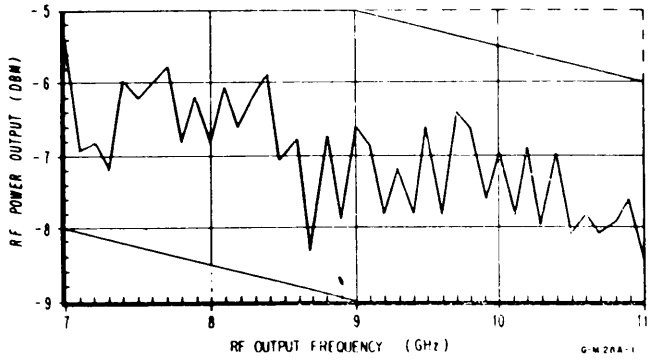


Figure 5-19. Typical Response Curve (620B).

h. Select a frequency where response curve crosses average line drawn in step g and set generator to this frequency.

i. Repeat step c.

j. Set generator output attenuator for -7 dBm reading on power meter and lock attenuator. If attenuator dial does not now read 7 (-7 dBm), remove plate covering hub of dial, loosen set screws holding dial to shaft and slip dial to read -7 dBm. Tighten set screws and replace plate over hub of dial.

k. Repeat steps c and j without changing generator frequency. The readings obtained on external power meter and from output attenuator should be the same. If not, repeat steps c and j until normal indications are obtained.

5-98. REPLACING AND RECALIBRATING THE ATTENUATOR (620B).

5-99. It is not expected that the attenuator dial will require recalibration unless the attenuator assembly is replaced. The attenuator is not ordinarily subject to change or breakage. Small improvements in accuracy may be made by slipping the attenuator dial on the front panel slightly on its shaft to bring into calibration. Following the replacement of the probe, the attenuator assembly must be adjusted for the correct and safe operating depth. The following operation is divided into two parts. The first concerns the replacement of the attenuator probe, and the second concerns the recalibration of the attenuator dial. To determine if the output attenuator is defective, measure the resistance between the center terminal of the RF OUTPUT jack and ground. The resistance should be approximately 50 ohms. A higher resistance indicates the film resistor that composes part of the pickup loop is damaged and the attenuator probe and cable must be replaced.

5-100 REPLACING THE ATTENUATOR PROBE (620B).

5-101 To replace the attenuator probe assembly, proceed as follows:

a. With the signal generator removed from its rack or cabinet and disconnected from the power source, unscrew the knurled nut behind the RF OUTPUTS CAL connector and pull attenuator cable from the jack. The center connector and spacing beads are removed with the cable. A new replacement assembly includes these parts already installed.

b. Free the attenuator cable from small clamp and feed cable out top of instrument noting the routing of the cable around the various decks.

c. Mark the attenuator cable where the cable enters the attenuator mounting block. Loosen the cap screw shown in Figure 5-20 on the mounting block holding the attenuator cable. Pull probe straight out.

d. Compare the new probe with the defective probe, marking the new probe at the same distance from the tip as the mark on the defective probe. Insert new probe carefully to the same depth as the original probe making sure that the ground end of the pickup loop points toward the resonator cavity (to the right when facing the Instrument).

e. Tighten cap screw finger-tight so that minor adjustment of the probe depth is still possible.

f. Carefully thread the cable under the cable clamp and around the casting to the front panel. DO NOT twist cable more than a quarter of a turn.

g. Remount RF OUTPUTS CAL connector. Tighten cable clamp.

h. After the attenuator assembly is replaced, an error of a few DB may exist in the calibration of the attenuator dial. Calibration may be checked as described in the following paragraph.

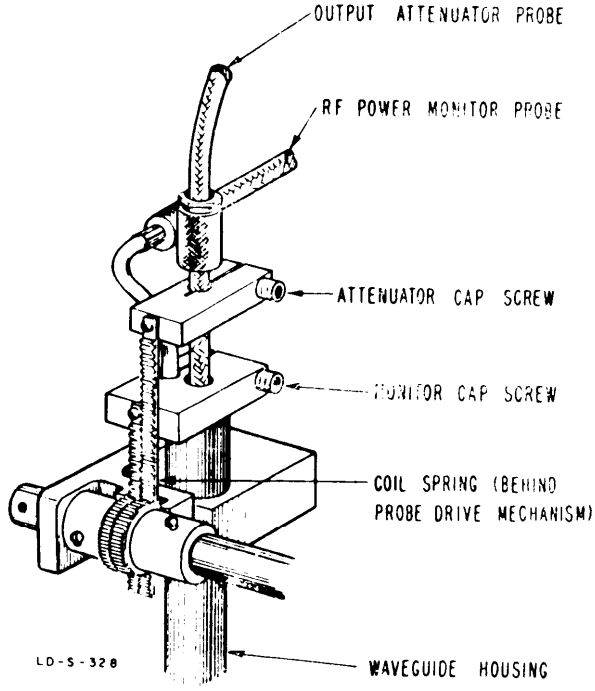


Figure 5-20. Attenuator and Monitor Probe Assemblies (620B).

5-102. RECALIBRATING THE ATTENUATOR (620B).

a. Connect Signal Generator in test setup shown in Figure 5-1. Allow Signal Generator to warm up with MOD. SELECTOR in CW position for at least twenty minutes.

b. Set MOD. SELECTOR to OFF.

c. Adjust Signal Generator to 9 GHz.

d. Connect Power Meter through a crystal detector to RF OUTPUT CAL connector; zero meter reading on Power Meter.

e. Set MOD. SELECTOR to CW.

f. Adjust POWER SET control so that the front-panel power meter reads 0 dBm.

g. Adjust the OUTPUT ATTEN control to -7 dBm.

WARNING

High voltage is present on the green lead below the attenuator assembly and at the terminals on the potentiometer above the frequency-drive casting. Be extremely careful not to touch these components when adjusting the attenuator probe with the instrument turned on.

h. Gently adjust the probe depth so that the external power meter indicates -7 dBm. Tighten the cap screw on the attenuator probe.

5-103. An initial setting has now been made that will be accurate within approximately ±5 dB. To refine this setting and obtain the original calibration accuracy of ±2 dB it is necessary to measure the output of the signal generator across the frequency range and construct a graph showing the frequency response of the instrument. Figure 5-19 shows such a graph with a typical response curve after the power output curve has been centered about the -7 dBm reference level. The final adjustment is made by slipping the attenuator dial, while measuring the RF output level at a convenient frequency on the curve, to bring the total power spread to be within the +2 dB limits of the -7 dBm reference level. The limits are indicated by the heavy transverse lines above and below the -7 dBm center line. Proceed as follows:

a. Assuming the Signal Generator is at normal operating temperature, set MOD. SELECTOR to OFF and zero the external power meter.

b. Set MOD. SELECTOR to CW and tune frequency dial to 7 GHz.

c. Adjust POWER SET control so that Meter indicates 0 dBm.

d. Check that OUTPUT ATTEN control is set to -7 dBm.

e. Record the reading on the eternal Power Meter.

f. Repeat steps c through e every 200 MHz from 7 GHz to 11GHz. Plot the resulting data as a response curve such as the one shown in Figure 5-19.

g. This curve should consist of a series of peaks and troughs with a maximum range of ±2 dBm.

h. Equalize the maximum excursions on each side of -7 dBm by slipping the attenuator dial. The dial is made free of the drive shaft by removing the hub cover from the center of the attenuator dial and loosening the two Allen screws in the periphery of the hub.

5-104. TUBE AND SEMICONDUCTOR REPLACEMENT.

5-105. Table 5-6 lists checks to be made after replacement of certain electron tubes and semiconductors (e.g., diodes, transistors). Replacement of unlisted items does not affect critical Signal Generator functions or operating voltages.

Note

Do not change an operating voltage or calibration adjustment unless it is either definitely outside specified tolerance or calibration accuracy of a dependent function is unsatisfactory. improving a marginal adjustment can adversely affect calibration.

5-106. ETCHED CIRCUITS.

5-107. The etched circuit boards in the Signal Generator are of the plated-through type consisting of metallic conductors bonded to both sides of insulating material. The metallic conductors are extended through the component mounting holes by a plating process. Soldering can be done from either side of the board with equally good results. Table 5-7 lists recommended tools and materials. Following are recommendations and precautions pertinent to etched circuit repair work.

a. Avoid unnecessary component substitution; it can result in damage to the circuit board and/or adjacent components.

b. Do not use a high-power soldering iron on etched circuit boards. Excessive heat may lift a conductor or damage the board.

c. Use a suction device (Table 5-7) or wooden toothpick to remove solder from component mounting holes. DO NOT USE A SHARP METAL OBJECT SUCH AS AN AWL OR TWIST DRILL FOR THIS PURPOSE. SHARP OBJECTS MAY DAMAGE THE PLATED-THROUGH CONDUCTOR.

d. After soldering, remove excess flux from the soldered areas and apply a protective coating to prevent contamination and corrosion. See Table 5-7 for recommendations.

e. When removing a multiple-connection component held tightly in a socket, such as a vacuum tube, loosen it gradually using gentle side-to-side or rotary motion to avoid damage to the plated-through conductors.

Table 5-6. Checks Following Tube and Semiconductor Replacement

Reference Designation	Check	Paragraphs
V103	PULSE RATE control calibration	5-43
V107	PULSE DELAY control calibration	5-45
V111	PULSE WIDTH control calibration	5-47
V114	Klystron frequency, current and voltage	5-39
V301 thru V305	-300V supply voltage	5-37
V401 thru V405	-1000V supply voltage	5-37
V501 thru V504	-1500 supply voltage	5-37
CR601 thru CR602	Power meter calibration	5-49
Q601 thru Q603	Power meter calibration	5-49

5-108. COMPONENT REPLACEMENT.

a. Remove defective component from circuit board.

Note

Axial lead components, such as resistors and tubular capacitors, can be replaced without unsoldering. Clip leads near body of defective component, remove component and straighten leads left in board. Wrap leads of replacement component one turn around original leads. Solder wrapped connection, and clip off excess lead.

b. Remove solder from mounting holes using a suction resoldering aid (Table 5-7) or wooden toothpick.

c. Shape leads of replacement component to match mounting hole spacing.

d. Insert component leads into mounting holes, and position component as original was positioned. DO NOT FORCE LEADS OF REPLACEMENT COMPONENT INTO MOUNTING HOLES. Sharp lead ends may damage plated-through conductor.

Table 5-7. Etched Circuit Soldering Equipment

Item	Use	Specification	Item Recommended
Soldering Tool	Soldering Unsoldering	Wattage rating: 37.5 Tip Temp: 750-800°F Tip Size: 1/8" OD	Ungar #776 Handle with Ungar #1237 Heating Unit
Soldering Tip, general purpose	Soldering Unsoldering	Shape: chisel Size: 1/8"	Ungar #PL113
De-soldering aid	Unsoldering multi-connection components (e.g., tube sockets)	Suction device to remove molten solder from connection	Soldapult by the Edsyn Company, Arleta, California
Resin (flux) solvent	Remove excess flux from soldered area before application of protective coating	Must not dissolve etched circuit base board material or conductor bonding agent	Freon Acetone Lacquer Thinner Isopropyl Alcohol (100% dry)
Solder	Component replacement Circuit board repair Wiring	Resin (flux) core, high tin content (60/40 tin/lead), 18 gauge (SWG) preferred	
Protective Coating	Contamination, corrosion protection after soldering	Good electrical insulation, corrosion-prevention properties	Krylon® #1302* Humiseal Protective Coating, Type 1B12 by Columbia Technical Corp. Woodside 77, New York

*Krylon, Inc., Norristown, Pennsylvania

5-109. TUBE SOCKET REPLACEMENT. There are three ways to remove a tube socket from the etched circuit boards:

a. Cut terminals attaching socket to circuit board, remove socket, and unsolder remaining terminal pieces individually.

b. Using long nose pliers, break insulating material of socket away from metal connectors, then unsolder connectors from board individually.

c. Use a special soldering iron tip designed to heat all socket connections simultaneously and remove socket as a unit; or use a suction device (Table 5-7) to desolder all connections and remove socket.

5-110. ETCHED CONDUCTOR REPAIR. A broken or burned section of conductor can be repaired by bridging the damaged section with a length of tinned copper wire. Allow adequate overlap and remove any varnish from etched conductor before soldering wire into place.

5-111. TRANSISTOR AND SEMICONDUCTOR DIODE REPLACEMENT.

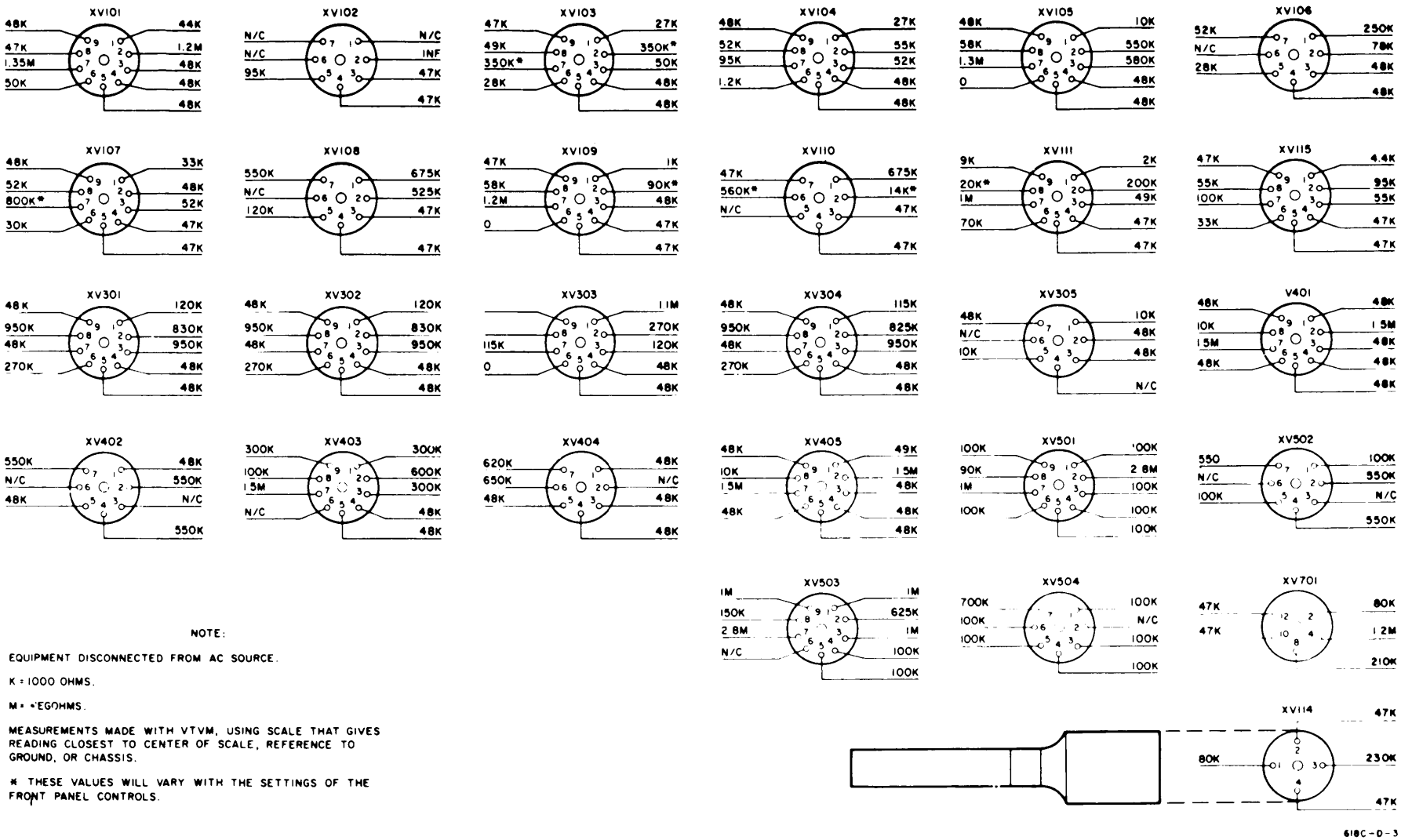
a. Do not apply excessive heat. See Table 5-7 for soldering tool specifications.

b. Use a heat sink such as pliers or hemostat between transistor body and hot soldering iron.

c. When installing a replacement transistor, ensure sufficient lead length to dissipate heat of soldering by maintaining about the same length of exposed lead as used for original transistor.

5-112. Q601, Q602 LEAD IDENTIFICATION.

5-113. Transistors Q601 and Q602 are dual transistors (i.e., two transistors in one case). For this configuration the locating tab which protrudes from the rim of the transistor case identifies the collector, not the emitter.



NOTE:

EQUIPMENT DISCONNECTED FROM AC SOURCE.

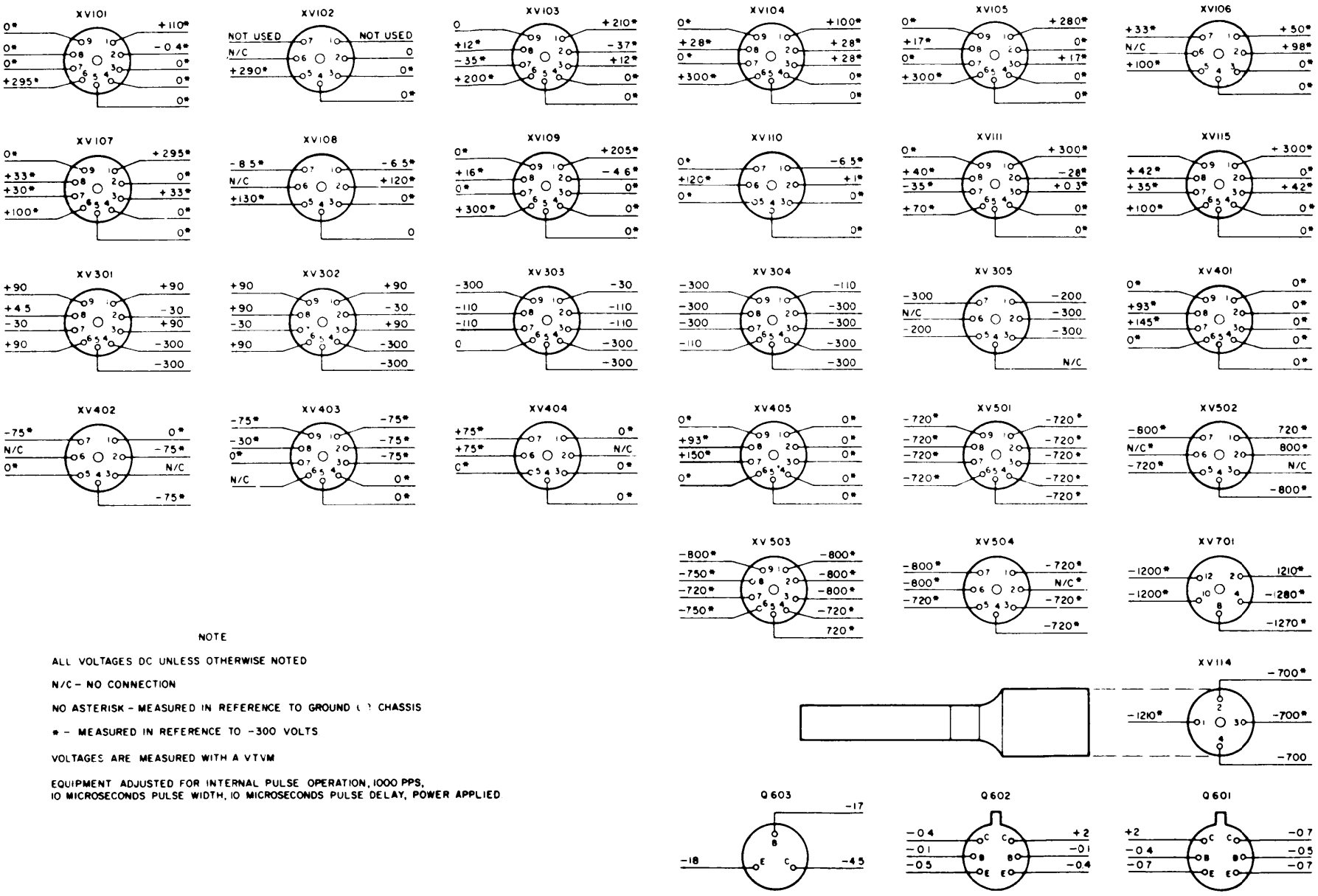
K = 1000 OHMS.

M = MEGOHMS.

MEASUREMENTS MADE WITH VTVM, USING SCALE THAT GIVES READING CLOSEST TO CENTER OF SCALE, REFERENCE TO GROUND, OR CHASSIS.

* THESE VALUES WILL VARY WITH THE SETTINGS OF THE FRONT PANEL CONTROLS.

Figure 5-21. Resistance Chart.



NOTE

ALL VOLTAGES DC UNLESS OTHERWISE NOTED

N/C – NO CONNECTION

NO ASTERISK – MEASURED IN REFERENCE TO GROUND ( ) CHASSIS

* – MEASURED IN REFERENCE TO -300 VOLTS

VOLTAGES ARE MEASURED WITH A VTVM

EQUIPMENT ADJUSTED FOR INTERNAL PULSE OPERATION, 1000 PPS,
10 MICROSECONDS PULSE WIDTH, 10 MICROSECONDS PULSE DELAY, POWER APPLIED

Figure 5-22. Voltage Chart.

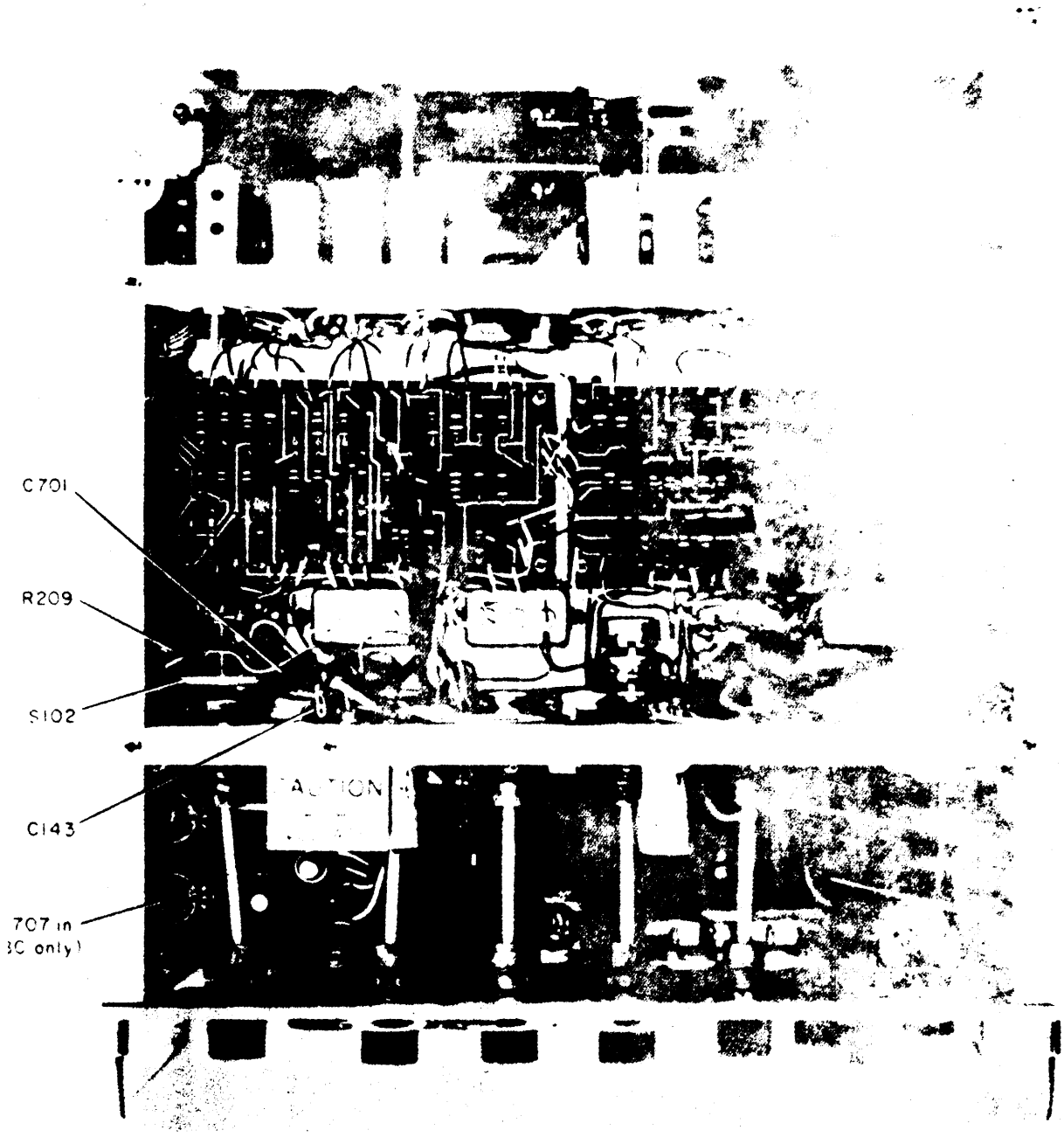


Figure 5-23. Interior View Showing Locations of Unlabeled Chassis Components (Top View).

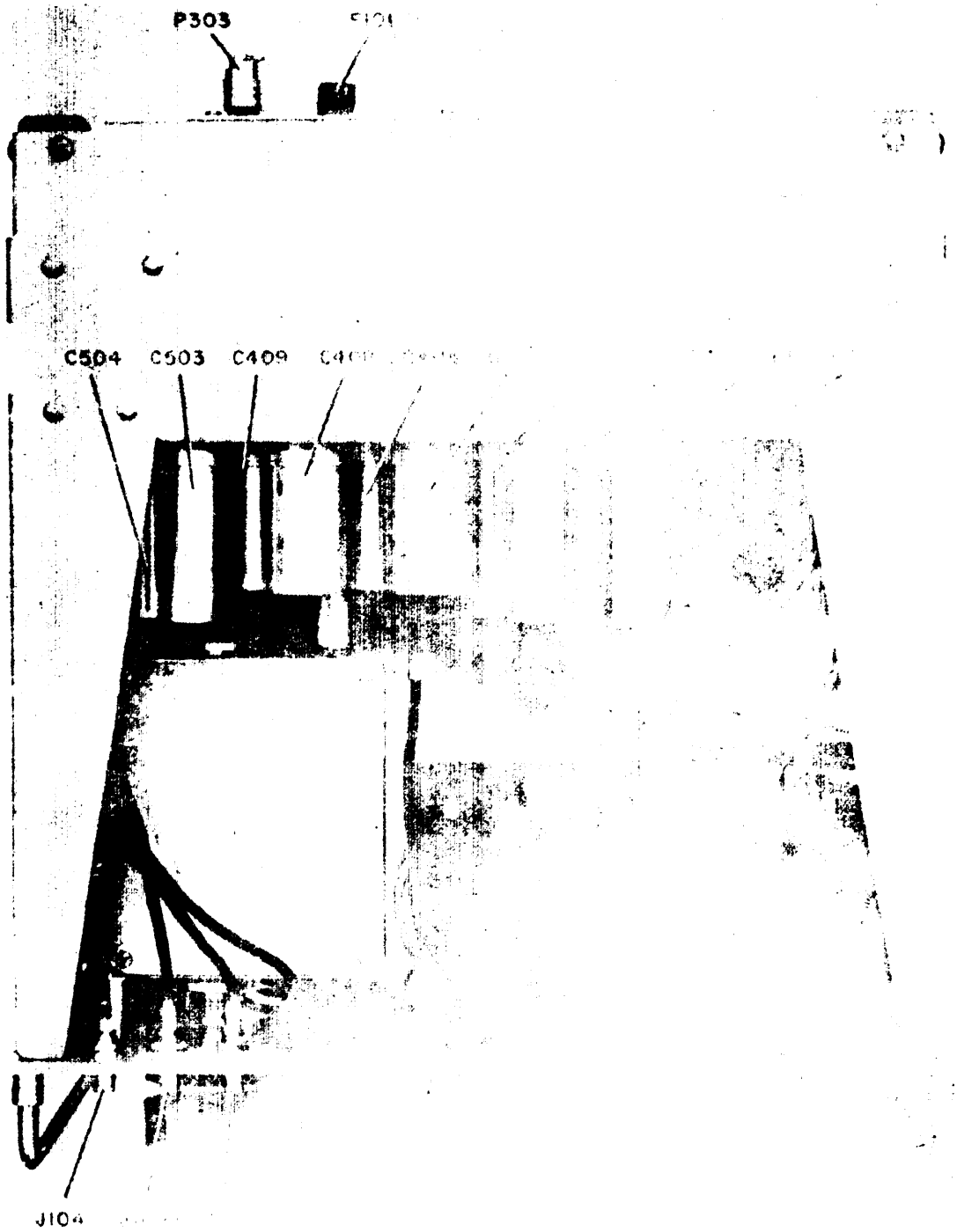


Figure 5-24. Component Identification, Bottom Interior View.

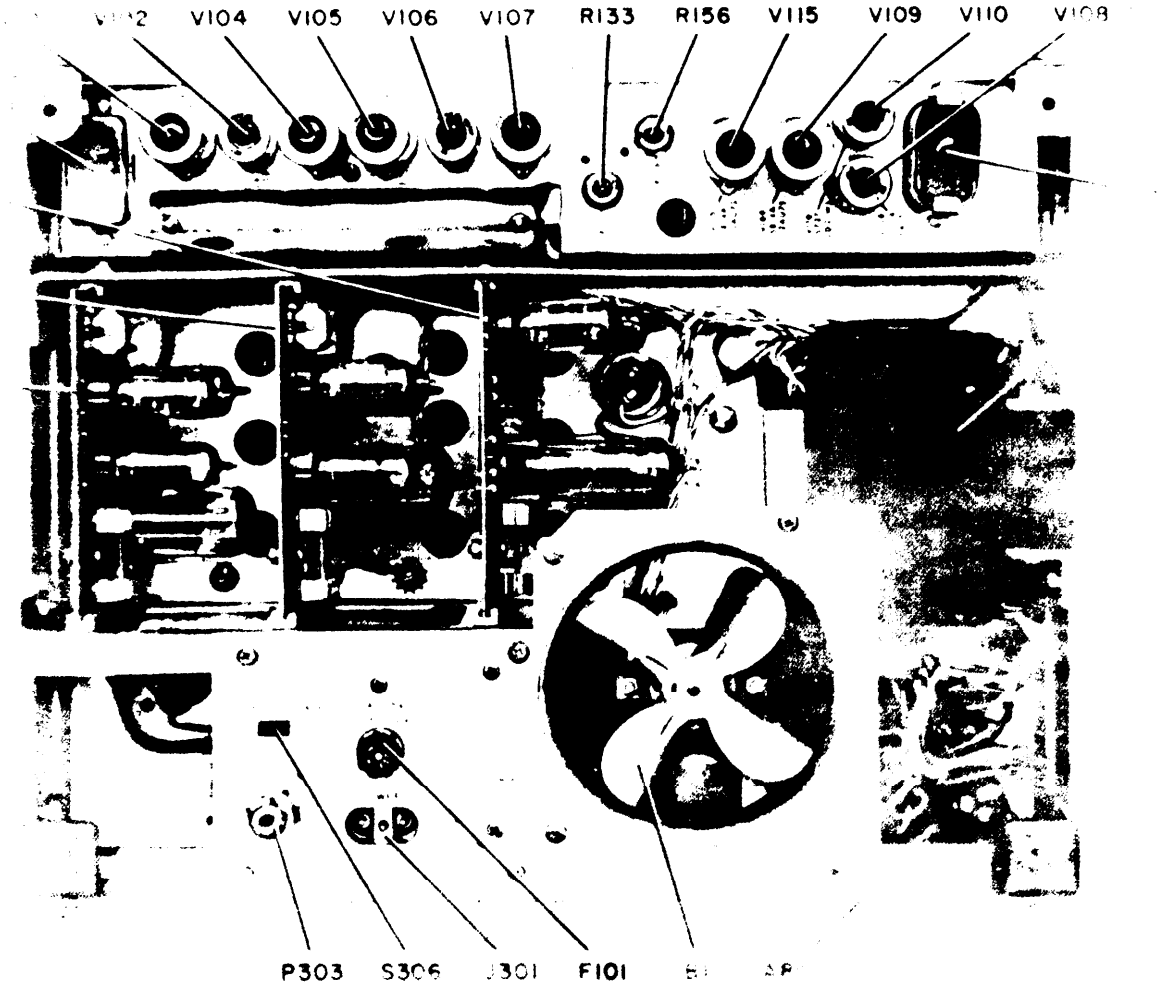
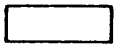


Figure 5-25. Component Identification, Rear Interior View.

1. Resistance in ohms, capacitance in microforads unless otherwise noted

2.  screwdriver adjust

3.  front panel designation

4.  test point

5.  voltage regulator (breakdown) diode

6. Waveform taken with Oscilloscope adjusted for ac coupling

7. Except for test point 23, all waveforms taken with front panel controls set as follows:

   MOD SELECTOR – INT

   PULSE WIDTH – 10

   PULSE DELAY – 0

   PULSE RATE – 200

   FM AMPLITUDE – Fully cw

8. Waveform taken at test point 23 taken with front panel controls set as listed in note 7 except MOD SELECTOR is set to INT FM.

9. Voltages shown on schematic diagrams are with respect to chassis ground.

Figure 5-26. Notes Pertaining to Waveform and Schematic Diagrams.

Test Point 14
(Notes 7
and 8)

0.2 MS/CM
0.2 V/CM

Test Point 15
(Notes 7
and 8)

0.2 MS/CM
2 V/CM

Test Point 16
(Notes 7
and 8)

0.2 MS/CM
0.05 V/CM

Test Point 17
(Notes 7
and 8)

0.2 MS/CM
0.5 V/CM

Test Point 18
(Notes 7
and 8)

0.2 MS/CM
2 V/CM

Test Point 19
(Notes 7
and 8)

0.2 MS/CM
0.2 V/CM

Test Point 20
(Notes 7
and 8)

0.2 MS/CM
0.5 V/CM

Test Point 21
(Notes 7
and 8)

0.2 MS/CM
0.1 V/CM

Test Point 22
(Notes 7
and 8)

0.2 MS/CM
5 V/CM

Test Point
(Notes 7
and 9)

0.2 MS/CM
5 V/CM

Figure 5-27. Waveforms.

APPENDIX A

REFERENCES

The following publications contain information applicable to the operation and maintenance of the SHF Signal Generator Models 618C/620B.

DA PAM 310-4	Index of Technical Manuals, Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA PAM 310-7	U.S. Army Equipment Index of Modifications Work Orders.
SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TB SIG 222	Solder and Soldering.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment
TM 38-750	The Army Maintenance Management Systems (TAMMS).
TM 740-90-1	Administrative storage of Equipment.

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. INSPECT. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. TEST. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

c. SERVICE. Not applicable.

d. ADJUST. To rectify to the extent necessary to bring into proper operating range.

e. ALIGN. To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of receivers or transmitters to the desired frequency.

f. CALIBRATE. Not applicable.

g. INSTALL. Not applicable.

h. REPLACE. To replace unserviceable items with serviceable like items.

i. REPAIR. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. OVERHAUL. Not applicable.

h. REBUILD. Not applicable.

l. SYMBOLS. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Format

a. Column 1, group number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, functional group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, maintenance functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance Category
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Column 4, tools and test equipment. Column 4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in Table I.

e. Column 5, Remarks. Self-explanatory.

B-4. Explanation of Format of Table I, Tool and Test Equipment Requirements

The columns in Table I, Tool and Test Equipment Requirements are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility,

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number of the specific tool or test equipment.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART (SHF SIGNAL GENERATOR, HEWLETT-PACKARD 618C)

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1	GENERATOR, SIGNAL HEWLETT-PACKARD 618C	O	H										1 thru 17, 19	
					H								1 thru 17, 19	
						H							1 thru 17, 19	
										H			18, 19	
1A	CIRCUIT CARD ASSEMBLY A300 (HP 00618-6060)	H	H						H	H			19 20 19 19	
1B	CIRCUIT CARD ASSEMBLY A400 (HP 00618-6061)	H	H						H	H			19 20 19 19	
1C	CIRCUIT CARD ASSEMBLY A500 (HP 00618-6062)	H	H						H	H			19 20 19 20	
1D	CIRCUIT CARD ASSEMBLY A600 (HP 00618-632)	H	H						H	H			19 12 19 19	

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS (SHF SIGNAL GENERATOR, HEWLETT-PACKARD, 618C)

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE RECOMMENDED IN MANUAL	MILITARY EQUIVALENT	FEDERAL STOCK NUMBER	TOOL NUMBER
		SIGNAL GENERATOR, HEWLETT-PACKARD, 618C (CONT'D)			
4	H	POWER METER, HP-431	WATTMETER AN/URM-98A	6625-566-4990	
5	H	THERMISTOR MOUNT, HP-8478A			
6	H	CRYSTAL DETECTOR, HP-423A		4940-871-8508	
7	H	ELECTRONIC COUNTER, HP-5245L	COUNTER, ELECTRONIC DIGITAL READOUT AN/USM-207A	6625-044-3228	
8	H	PLUG-IN-UNIT, HP-5253B			
9	H	MICROWAVE FREQUENCY CONVERTER, HP-2590A			
10	H	VARIABLE TRANSFORMER, GR-W10WT3	TRANSFORMER, VARIABLE POWER CN-16B/U	6625-235-2086	
11	H	OSCILLOSCOPE, HP-175/HP-1750B	OSCILLOSCOPE AN/USM-281A	6625-228-2201	
12	H	PULSE GENERATOR, HP-214A			
13	H	SPECTRUM ANALYZER, HP-8551/851A/B			
14	H	OSCILLATOR, HP-200CD	GENERATOR, SIGNAL AN/USM-205	6625-788-9672	
15	H	VTVM, HP-410C	MULTIMETER ME-26D/U	6625-913-9781	
16	H	CLIP-ON AMMETER, HP-428B			
17	H	CABLE ASSEMBLY, HP-11500A			
18	H	CABLE ASSEMBLY, HP-10502A			
19	H	CABLE ASSEMBLY, HP-10503A			
20	H	CABLE ASSEMBLY, HP-11001A			
21	H	SOCKET WRENCH, HP-618B/38			
22	H	TOOL KIT, TK-100/G	TOOL KIT, ELECTRONIC EQUIP TK-100/G	5180-605-0079	
23	H	TEST SET, ELECTRON TUBE TV-7D/U	TEST SET, TUBE TV-7D/U	6625-820-0064	

APPENDIX C

ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

Section I. INTRODUCTION

C-1. Scope

This appendix lists repair parts required for the performance of organizational, direct support, general support and depot maintenance of the AN/URM-170.

NOTE

No special tools, test, and support equipment required.

C-2. General

This repair parts list is divided into the following sections:

a. Organizational Maintenance Repair Parts List-Section II. A list of repair parts authorized for the performance of maintenance at the organizational level.

b. Repair Parts for Direct Support, General Support, and Depot Maintenance—Section III. A list of repair parts authorized for the performance of maintenance at the direct support, general support and depot level.

c. Federal Stock Number Cross Reference - Section IV. A list of Federal stock numbers in ascending numerical sequence, cross-referenced to the figure number, reference designator, and item sequence number.

d. Manufacturer Part Number Cross Reference - Section V. A list of reference numbers (manufacturer part number) appearing in ascending numeric-alpha and/or alpha-numeric sequence, cross-referenced to the Federal manufacturer code, figure number, reference designator, and item sequence number.

e. Reference Designator Cross Reference — Section VI. A list of reference designators cross-referenced to item sequence number.

C-3. Explanation of Column

The following provides an explanations in the tabular lists:

a. Source, Maintenance, and Recoverability Codes (SMR) and Item Sequence Number (ISN) Column. The first line in this column lists the applicable SMR codes for the part. Listed in ascending order directly below the SMR code is the item sequence number assigned to the repair part.

(1) Source code indicates the selection status and source for the listed item. Source codes are:

Code	*Explanation*
P	— Repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.
P2	— Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	— Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 380-41.
P10	- Assigned to items which are NSA designed controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 38041, and which are stocked and supplied by the Army COMSEC logistic system.

Code	*Explanation*
M	Repair parts which are not procured or stocked, but are to be manufactured in indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately, and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1	Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.
X2	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain same through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.
G	—Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) Maintenance code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are:

Code	*Explanation*
C _ _ _ _ _ _ _	Operator/Crew
O _ _ _ _ _ _	Organizational maintenance
F _ _ _ _ _ _ _	Direct support maintenance
H _ _ _ _ _ _ _	General Support maintenance
D _ _ _ _ _ _ _	Depot maintenance

(3) Recoverability code indicates whether unserviceable items should be returned for recovery or salvage. items not coded are expendable. Recoverability codes are:

Code	*Explanation*
R	Repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.
S	Repair parts and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, or high dollar value reusable casings or castings.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Indent Code. This column indicates the breakdown of each given part or assembly. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. An asterisk indicates attaching hardware.

d. Description. Indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses. For subsequent appearances of the same item, the words "same as" followed by the item sequence number assigned to the item when it first appeared in the list will follow the item name, e.g., "RESISTOR, FIXED, COMPOSITION: SAME AS A298".

e. Usable on Code. Not Used.

f. Unit of Measure (U/M). A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft., ea., pr., etc.

g. Quantity Incorporated in Unit. Indicates the quantity of the item used in the AN/URM–170. Subsequent appearances of the

same item in the same assembly are indicated by the letters "REF".

h. Allowances. (15-Day Organizational Maintenance, 30-Day DS/GS Maintenance, 1 Year Per Equipment (Contingency) and Depot Maintenance). Items authorized for requisition as required are identified by an asterisk in the allowance columns.

i. Illustrations.

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Reference designator or item number.* Indicates the reference designator used to identify the item in the illustration.

C-4. Location of Repair Parts

a. This appendix contains three cross-reference indexes (sect. *IV, V* and *VI)* to be used to locate a repair part when either the Federal stock number, reference number (manufacturer's part number), figure number, or reference designator is known. The first column in each cross-reference index is prepared, as applicable, in numerical or alphanumerical sequence. The last column of each cross-reference index lists the item sequence number assigned to the part.

b. Refer to the appropriate cross-reference index (para. C-2c, d, e) and note the index number in the last column; then refer to the repair parts list to locate the item sequence number which is listed in ascending order in column 1 of the repair parts list.

C-5 Federal Supply Code for Manufacturers

The Federal supply code for manufacturer (FSCM) is used as an element in item identification to designate manufacturer, distributor, or government agency, etc. Refer to SB 708-42 for identification of FSCM's.

(1) SOURCE CODE / MAINT. CODE / REC. CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) / MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY. INCL. IN UNIT	(6) 15 DAY ORGANIZATIONAL MAINT. ALW. (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
Y101	6625-883-3256	A	GENERATOR,SIGNAL AN/URM-170 (28480)		EA	1					C-1	
P 0 Y130	6150-351-3405	B	CABLE ASSEMBLY,POWER,ELEC 7.500 FT L, 17250C (70903)		EA	1	*	*	*	*	C-2	W1
P 0 Y157	5960-958-0073	C	ELECTRON TUBE MILE1TYPE7895 (81349)		EA	1	*	*	*	*	C-5	A700V701
P 0 Y183	5920-280-8344	C	FUSE,CARTRIDGE 0.5 AMP, 250 V, 3 AG TYPE, 1.250 IN. L 312-500 (75915)		EA	1	*	*	*	*	C-6	A500F501
P 0 Y184	6240-912-5186	C	LAMP,GLOW 1-17 WATT, 95 V, STYLE T-2, H BRT A1C (08108)		EA	3	*	*	*	*	C-6	A500DS501
P 0 Y221	5920-199-9498	C	FUSE,CARTRIDGE 1/2 AMP, 125V 313-500 (75915)		EA	2	*	*	*	*	C-7	A300F301
P 0 Y222	6240-912-5186	C	LAMP,GLOW SAME AS Y184 A1C (08108)		EA	REF	*	*	*	*	C-7	A300DS301
P 0 Y260	5920-199-9498	C	FUSE,CARTRIDGE SAME AS Y221 313-500 (75915)		EA	REF	*	*	*	*	C-8	A400F401
P 0 Y261	6240-912-5186	C	LAMP,GLOW SAME AS Y184 A1C (08108)		EA	REF	*	*	*	*	C-8	A400DS401
P 0 Y296	5960-557-6780	B	ELECTRON TUBE RECEIVING 6C4 (80131)		EA	2	*	*	*	*	C-2	V404
P 0 Y297	5960-557-6780	B	ELECTRON TUBE SAME AS Y296 6C4 (80131)		EA	REF	*	*	*	*	C-2	V504
P 0 Y298	5960-624-4718	B	ELECTRON TUBE VOLTAGE REGULATOR, RECEIVING 0B2 (80131)		EA	1	*	*	*	*	C-2	V305
P 0 Y300	5960-827-8782	B	ELECTRON TUBE 12AX7A (81349)		EA	2	*	*	*	*	C-2	V303

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.)	MFR CODE	(2c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	(6) 15 DAY ORGANIZATIONAL MAINT ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF / ITEM NUMBER
P O Y301	5960-827-8782	B	ELECTRON TUBE SAME AS Y300 12AX7A	(81349)		EA	REF	*	*	*	*	C-2	V304
P O Y302	5960-262-0286	B	ELECTRON TUBE VOLTAGE REGULATOR TYPE 5651A	(80131)		EA	2	*	*	*	*	C-2	V402
P O Y303	5960-262-0286	B	ELECTRON TUBE SAME AS Y302 5651A	(80131)		EA	REF	*	*	*	*	C-2	V502
P O Y304	5960-269-3691	B	ELECTRON TUBE POWER PENTODE, 3.625 IN. LG 1923-0071	(28480)		EA	3	*	*	*	*	C-2	V401
P O Y305	5960-269-3691	B	ELECTRON TUBE SAME AS Y304 1923-0071	(28480)		EA	REF	*	*	*	*	C-2	V405
P O Y306	5960-269-3691	B	ELECTRON TUBE SAME AS Y304 1923-0071	(28480)		EA	REF	*	*	*	*	C-2	V501
P O Y307	5960-967-1083	B	ELECTRON TUBE AMPLIFRAME IF SHARP CUTOFF PENTODE 6EJ7EF184	(80131)		EA	2	*	*	*	*	C-2	V403
P O Y308	5960-967-1083	B	ELECTRON TUBE SAME AS Y307 6EJ7EF184	(80131)		EA	REF	*	*	*	*	C-2	V503
P O Y309	5960-088-6527	B	ELECTRON TUBE 7233	(33173)		EA	2	*	*	*	*	C-2	V301
P O Y310	5960-088-6527	B	ELECTRON TUBE SAME AS Y309 7233	(33173)		EA	REF	*	*	*	*	C-2	V302
P O Y319	5920-131-9821	B	FUSE,CARTRIDGE 3 AMP, 125 VOLT, SLOW BLOW MDX3	1400)		EA	1	*	*	*	*	C-3	F101
P O Y530	5355-646-4704	C	KNOB PHENOLIC, 1.000 IN. OD 0370-0029	(28480)		EA	2	*	*	*	*	C-12	A2MP48
P O Y531	5355-646-4704	C	KNOB SAME AS Y530 0370-0029	(28480)		EA	REF	*	*	*	*	C-12	A2MP49

(1) SOURCE CODE / MAINT. CODE / REC. CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) / MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY. INCL. IN UNIT	(6) 15 DAY ORGANIZATIONAL MAINT. ALW. (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P O Y532	5355-543-0066	C	KNOB BLK PHEN, 0.734 IN. L, 1.625 IN. OD 0370-0038 (28480)		EA	2	*	*	*	*	C-12	A2MP52
P O Y533	5355-543-0066	C	KNOB SAME AS Y532 0370-0038 (28480)		EA	REF	*	*	*	*	C-12	A2MP53
P O Y534	5355-547-7996	C	KNOB PHENOLIC, 1.625 IN. X 0.750 IN. X 1.000 OD 0370-0035 (28480)		EA	2	*	*	*	*	C-12	A2MP50
P O Y535	5355-547-7996	C	KNOB SAME AS Y534 0370-0035 (28480)		EA	REF	*	*	*	*	C-12	A2MP51
P O Y536	5355-579-2318	C	KNOB BLK PHEN, 0.500 IN. L X 0.375 IN. OD 0370-0050 (28480)		EA	1	*	*	*	*	C-12	A2MP54
P O Y805	5960-134-9919	C	ELECTRON TUBE 6AL5 (80131)		EA	3	*	*	*	*	C-19	A1V102
P O Y806	5960-134-9919	C	ELECTRON TUBE SAME AS Y805 6AL5 (80131)		EA	REF	*	*	*	*	C-19	A1V106
P O Y807	5960-134-9919	C	ELECTRON TUBE SAME AS Y805 6AL5 (80131)		EA	REF	*	*	*	*	C-19	A1V[illegible]
P O Y808	5960-552-0082	C	ELECTRON TUBE POWER PENTODE, 2.750 IN. X 1.125 IN. 1941-0005 (28480)		EA	1	*	*	*	*	C-19	A1V110
P O Y809	5960-615-5584	C	ELECTRON TUBE TWIN TRIODE 12AT7 (80131)		EA	1	*	*	*	*	C-19	A1V101
P O Y810	5960-134-6012	C	ELECTRON TUBE 6189W (81349)		EA	7	*	*	*	*	C-19	A1V103
P O Y811	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	C-19	A1V104
P O Y812	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	C-19	A1V105

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.)	MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	(6) 15 DAY ORGANIZATIONAL MAINT ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P O Y813	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W	(81349)		EA	REF	*	*	*	*	C-19	A1V107
P O Y814	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W	(81349)		EA	REF	*	*	*	*	C-19	A1V109
P O Y815	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W	(81349)		EA	REF	*	*	*	*	C-19	A1V111
P O Y816	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W	(81349)		EA	REF	*	*	*	*	C-19	A1V115

(1) SOURCE CODE / MAINT. CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY. INCL. IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	DS 21-50	DS 51-100	(7) GS 1-20	GS 21-50	GS 51-100	(8) 1 YR. ALW. PER 100 EQUIP. CONTGCY PL	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
G O S Y101	6625-883-3256	A	GENERATOR,SIGNAL AN/URM-170 618C (28480)		EA	1									C-1	
M D Y102		B	BRACKET,ANGLE AL, 4.312 IN. X 2.312 IN. X 0.063 IN. THK 00618-0049 (28480)		EA	2										MP17
M D Y103		B	BRACKET,ANGLE SAME AS Y102 00618-0049 (28480)		EA	REF										MP18
P H Y104	5305-054-6668	*	SCREW,MACHINE CRES, 8-32 X 3/8 IN. LG MS51957-43 (96906)		EA	21				*	*	*	*	*		H2
P H Y105	5310-905-5159	*	WASHER,LOCK MS35335-87 (96906)		EA	26				*	*	*	*	*		H2
M D Y106		B	BRACKET,MOUNTING AL, 1.187 IN. X 1.187 IN. X 1.187 O/A 618B12D (28480)		EA	1										MP3
X2 H Y107		*	SCREW,MACHINE CAD PL STL, OVH, 10-24 X 0.500 IN. L 11608 (73734)		EA	16										H1
M D Y108		B	BRACKET,MOUNTING AL, 1.187 IN. X 1.187 IN. X 1.187 IN. O/A 618B12E (28480)		EA	1										MP4
X2 H Y109		*	SCREW,MACHINE SAME AS Y107 11608 (73734)		EA	REF										H1
M D Y110		B	BRACKET,MOUNTING AL, 2.500 IN. X 2.000 IN. X 0.500 IN. O/A 00618-0052 (28480)		EA	2										MP20
M D Y111		B	BRACKET,MOUNTING SAME AS Y110 00618-0052 (28480)		EA	REF										MP21
P H Y112	5305-057-0523	*	SCREW,MACHINE MS51958-27 (96906)		EA	10				*	*	*	*	*		H2

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR. ALW. PER 100 EQUIP. CONTGCY PL	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P H Y113	5310-939-0903	*	WASHER,LOCK MS35335-86 (96906)		EA	41				*	*	*	*	*		H2
M D Y114		B	BRACKET,MOUNTING AL, 4.125 IN. X 3.375 IN. X 0.093 IN. THK 00618-030 (28480)		EA	1										MP15
P H Y115	5310-934-9759	*	NUT,PLAIN,HEXAGON MS35649-284 (96906)		EA	1				*	*	*	*	*		H1
P H Y116	5310-934-9765	*	NUT,PLAIN,HEXAGON MS35650-304 (96906)		EA	8				*	*	*	*	*		H4
X2 H Y117		*	SCREW,MACHINE CAD PL STL, PNH, 8-32 X 2.500 IN. L 12077 (73734)		EA	1										H1
X2 H Y118		*	SCREW,MACHINE SAME AS Y107 11608 (73734)		EA	REF										H4
P H Y119	5310-880-5978	*	WASHER,FLAT CRES, 0.049 X 0.188 X 0.375 MS15795-807 (96906)		EA	21				*	*	*	*	*		H1
P H Y120	5310-933-8120	*	WASHER,LOCK CRES, NO. 10 MS35338-138 (96906)		EA	4				*	*	*	*	*		H4
P H Y121	5310-045-3296	*	WASHER,LOCK MS35338-43 (96906)		EA	5				*	*	*	*	*		H1
M D Y122		B	BRACKET,MOUNTING AL, 9.800 IN. X 5.680 IN. X 0.064 IN. THK 00618-00070 (28480)		EA	1										MP27
X2 H Y123		B	BUSHING,LOCK BRS, NP, 3/8-32, 0.500 IN. OD 1510BUSHING (88245)		EA	1										MP6
X1 O Y124		B	CABINET ASSEMBLY AL, 17.000 IN. X 16.625 IN. X 13.500 IN. O/A 00618-6056 (28480)		EA	1										MP13

(1) SOURCE CODE MAINT. CODE REC. CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY. INCL. IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR. ALW. PER 100 EQUIP. CONTGCY PL	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(10) ILLUSTRATIONS (b) REF. / ITEM NUMBER
P H Y125	5310-934-9765	*	NUT,PLAIN,HEXAGON SAME AS Y116 MS35650-304 (96906)		EA	REF				*	*	*		*		H4
P H Y126	5310-934-9761	*	NUT,PLAIN,HEXAGON MS35649-264 (96906)		EA	16				*	*	*	*	*		H1
P H Y127	5305-057-0524	*	SCREW,MACHINE CRES, 6-32 X 3/8 IN LG MS51958-28 (96906)		EA	27				*	*	*	*	*		H1
P H Y128	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H4
P H Y129	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H4
P O Y130	6150-351-3405	B	CABLE ASSEMBLY,POWER,ELEC 7.500 FT L, 17250C (70903)		EA	1	*	*	*	*	*	*	*	*	C-2	W1
P H Y131	5910-681-9264	B	CAPACITOR,FIXED,PAPER 4.000 UF, 10 PCT, 1000 VDCW 0160-0102 (28480)		EA	3				*	*	*	*	*	C-2	C407
P H Y132	5910-681-9264	B	CAPACITOR,FIXED,PAPER SAME AS Y131 0160-0102 (28480)		EA	REF				*	*	*	*	*	C-2	C508
P H Y133	5910-681-9264	B	CAPACITOR,FIXED,PAPER SAME AS Y131 0160-0102 (28480)		EA	REF				*	*	*	*	*	C-2	C509
P H Y134	5910-087-3522	B	CAPACITOR,FIXED,ELECTROLYTIC 40 UF, PLUS 50-10 PCT, 450 VDCW 0180-0024 (28480)		EA	5				*	*	*	*	*	C-3	C362
P H Y135	5910-087-3522	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y134 0180-0024 (28480)		EA	REF				*	*	*	*	*	C-3	C363
P H Y136	5910-087-3522	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y134 0180-0024 (28480)		EA	REF				*	*	*	*	*	C-3	C365
P H Y137	5910-087-3522	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y134 0180-0024 (28480)		EA	REF				*	*	*	*	*	C-3	C503

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR. ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(10) ILLUSTRATIONS (b) REF. / ITEM NUMBER
P H Y138	5910-087-3522	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y134 0180-0024 (28480)		EA	REF				*	*	*	*	*	C-3	C504
P H Y139	5910-087-6816	B	CAPACITOR,FIXED,ELECTROLYTIC 120 UF, 350 VDCW 0180-0042 (28480)		EA	4				*	*	*	*	*	C-3	C403
P H Y140	5910-087-6816	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y139 0180-0042 (28480)		EA	REF				*	*	*	*	*	C-3	C404
P H Y141	5910-087-6816	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y139 0180-0042 (28480)		EA	REF				*	*	*	*	*	C-3	C408
P H Y142	5910-087-6816	B	CAPACITOR,FIXED,ELECTROLYTIC SAME AS Y139 0180-0042 (28480)		EA	REF				*	*	*	*	*	C-3	C409
P H Y143	5910-931-1908	B	CAPACITOR,FIXED,ELECTROLYTIC 2800 UF, PLUS 50-10 PCT, 30 VDCW 0180-0128 (28480)		EA	1				*	*	*	*	*	C-3	C601
X1 H Y144		B	CHASSIS,ELECTRICAL,EQUIPMENT AL, 15.875 IN. X 9.500 IN. X 5.625 IN. O/A 00618-0054 (28480)		EA	1										MP23
P H Y145	6625-213-2625	B	CIRCUIT CARD ASSEMBLY 3.750 IN. X 3.000 IN. X 0.875 IN. O/A 00618-6075 (28480)		EA	1				*	*	*	*	*	C-2	A800
P H Y146	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H1
P H Y147	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H1
P H Y148	5310-184-8977	*	WASHER,LOCK MS35338-98 (96906)		EA	14				*	*	*	*	*		H1
X1 H Y149		C	PRINTED WIRING BOARD PHENOLIC, 3.750 IN. X 3.000 IN. X 0.062 THK 00618-2052 (28480)		EA	1										A800PW1

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P H Y150	5961-060-8638	C	SEMICONDUCTOR DEVICE,DIODE SILICON, 0.5 AMP 1901-0026 (28480)		EA	3				*	*	*	*	*	C-2	A800CR801
P H Y151	5961-060-8638	C	SEMICONDUCTOR DEVICE,DIODE SAME AS Y150 1901-0026 (28480)		EA	REF				*	*	*	*	*	C-2	A800CR802
P H S Y152	6625-207-9967	B	CIRCUIT CARD ASSEMBLY 4.000 IN. X 4.000 IN. X 0.875 IN. O/A 00618-6076 (28480)		EA	1				*	*	*	*	*	C-4	A700
P H Y153	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H2
P H Y154	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H2
P H Y155	5310-045-3296	*	WASHER,LOCK SAME AS Y121 MS35338-43 (96906)		EA	REF				*	*	*	*	*		H2
P H Y156	5910-854-7130	C	CAPACITOR,FIXED,CERAMIC DI 0.01 UF, 20 PCT, 3000 VDCW 30GAS10 (56289)		EA	2				*	*	*	*	*	C-5	A700C701
P O Y157	5960-958-0073	C	ELECTRON TUBE MILE1TYPE7895 (81349)		EA	1	*	*	*	*	*	*	*	*	C-5	A700V701
M D Y158		C	PLATE,INDENTIFICATION AL FOIL, 0.750 IN. X 0.187 IN. X 0.005 THK 00618-2057 (28480)		EA	1										A700E1
X1 H Y159		C	PRINTED WIRING BOARD PHENOLIC, 4.000 IN. X 4.000 IN. X 0.063 THK 00618-2051 (28480)		EA	1										A700PW1
P H Y160	5905-994-8548	C	RESISTOR,FIXED,FILM 383000 OHM, 1 PCT, 1/2W MF7CD3833F (19701)		EA	2				*	*	*	*	*	C-5	A700R708
P H Y161	5905-213-6131	C	RESISTOR,FIXED,FILM 75000 OHM, 10 PCT, 7 WATT FP7-7502K (16299)		EA	1				*	*	*	*	*	C-5	A700R705

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P H Y162	5905-994-8544	C	RESISTOR,FIXED,FILM 243000 OHMS, 1 PCT, 1/2W MF7CD2433F (19701)		EA	1				*	*	*	*	*	C-5	A700R702
P H Y163	5905-931-0286	C	RESISTOR,FIXED,FILM 1.1 MEGOHM, 1 PCT, 1/2W MF7CD1104F (19701)		EA	3				*	*	*	*	*	C-5	A700R701
P H Y164	5905-208-4340	C	RESISTOR,FIXED,FILM 24000 OHM, 10 PCT, 4 WATT FP4-2402K (16299)		EA	1				*	*	*	*	*	C-5	A700R703
P H Y165	5905-172-0856	C	RESISTOR,VARIABLE 10000 OHM, 30 PCT, 1/4W 2100-2154 (28480)		EA	2				*	*	*	*	*	C-5	A700R706
P H Y166	5905-172-0856	C	RESISTOR,VARIABLE SAME AS Y165 2100-2154 (28480)		EA	REF				*	*	*	*	*	C-5	A700R707
P H Y167	5961-060-8638	C	SEMICONDUCTOR DEVICE,DIODE SAME AS Y150 1901-0026 (28480)		EA	REF				*	*	*	*	*	C-5	A700CR702
P H Y168	5961-931-0286	C	SEMICONDUCTOR DEVICE,DIODE AXIAL LEADS, 100 VOLT, PORM 5 PCT, 1W 1902-0241 (28480)		EA	1				*	*	*	*	*	C-5	A700CR701
P H Y169	5961-938-5641	C	SEMICONDUCTOR DEVICE,DIODE SILICON 1N629 (80131)		EA	1				*	*	*	*	*	C-5	A700CR703
P H Y170	5935-945-9824	C	SOCKET,ELECTRON TUBE 133-65-11-026 (71785)		EA	1				*	*	*	*	*	C-5	A700XV701
P H S Y171		B	CIRCUIT CARD ASSEMBLY 1500 V, 5.343 IN. X 5.000 IN. X 1.750 IN O/A 00618-6062 (28480)		EA	1				*	*	*	*	*	C-2	A500
P H Y172	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI 0.05 UF, 20 PCT, 500 VDCW 5GAS50 (56289)		EA	7				*	*	*	*	*	C-6	A500C505
P H Y173	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GAS50 (56289)		EA	REF				*	*	*	*	*	C-6	A500C506

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P H Y174	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GA$50 (56289)		EA	REF				*	*	*	*	*	C-6	A500C507
P H Y175	5820-144-8083	C	COMPRESSOR DEHYDRATOR A3 (06178)		EA	2				*	*	*	*	*	C-6	A500C501
P H Y176	5820-144-8083	C	COMPRESSOR DEHYDRATOR SAME AS Y175 A3 (06178)		EA	REF				*	*	*	*	*	C-6	A500C502
P H Y177	5920-804-9688	C	FUSEHOLDER 1400-0008 (28480)		EA	3				*	*	*	*	*	C-6	A500XF501
P H Y178	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H1
P H Y179	5305-057-0526	*	SCREW,MACHINE MS51958-30 (96906)		EA	9				*	*	*	*	*		H1
P H Y180	5310-880-5976	*	WASHER,FLAT MS15795-806 (96906)		EA	13				*	*	*	*	*		H1
P H Y181	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H1
P H Y182	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H1
P O Y183	5920-280-8344	C	FUSE,CARTRIDGE 0.5 AMP, 250 V, 3 AG TYPE, 1.250 IN. L 312-500 (75915)		EA	1	*	*	*	*	*	*	*	*	C-6	A500F501
P O Y184	6240-912-5186	C	LAMP,GLOW 1-17 WATT, 95 V, STYLE T-2, H BRT A1C (08108)		EA	3	*	*	*	*	*	*	*	*	C-6	A500DS501
X1 H Y185		C	PRINTED WIRING BOARD PHENOLIC, 5.343 IN. X 5.000 IN. X 0.063 THK 00618-2055 (28480)		EA	1										A500PW1

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P H Y186	5905-079-3197	C	RESISTOR,FIXED,FILM 475000 OHMS, 1 PCT, 1/4W RN60D4753F	(81349)		EA	5				*	*	*	*	*	C-6	A500R510
P H Y187	5905-172-0854	C	RESISTOR,FIXED,FILM 47000 OHM, 10 PCT, 7 WATT FP7-4702K	(16299)		EA	1				*	*	*	*	*	C-6	A500R528
P H Y188	5905-345-7675	C	RESISTOR,FIXED,FILM 1.30 MEGOHM, 1 PCT, 1/2W MF7CD1304F	(19701)		EA	2				*	*	*	*	*	C-6	A500R509
P H Y189	5905-477-1201	C	RESISTOR,FIXED,COMPOSITION 47 OHM, 5 PCT, 2W RCR42G470JS	(81349)		EA	1				*	*	*	*	*	C-6	A500R501
P H Y190	5905-058-8468	C	RESISTOR,FIXED,FILM 56200 OHM, 1 PCT, 1/2W MF7CD5622F	(19701)		EA	2				*	*	*	*	*	C-6	A500R507
P H Y191	5905-930-7956	C	RESISTOR,FIXED,FILM 100000 OHM, 1 PCT, 1/2W MF7CD1003F	(19701)		EA	1				*	*	*	*	*	C-6	A500R518
P H Y192		C	RESISTOR,FIXED,FILM 75000 OHM, 10 PCT, 7 WATT LP1-7-7502K	(16299)		EA	1				*	*	*	*	*	C-6	A500R514
P H Y193	5905-456-5251	C	RESISTOR,FIXED,FILM 1.5 MEGOHM, 1 PCT, 1/2W MF7CD1504F	(19701)		EA	4				*	*	*	*	*	C-6	A500R506
P H Y194	5905-057-5576	C	RESISTOR,FIXED,FILM 681000 OHMS, 1 PCT, 1/4W RN60D6813F	(81349)		EA	1				*	*	*	*	*	C-6	A500R513
P H Y195	5905-069-3922	C	RESISTOR,FIXED,FILM 68100 OHM, 1 PCT, 1/4W RN60D6812F	(81349)		EA	2				*	*	*	*	*	C-6	A500R505
P H Y196	5905-894-3407	C	RESISTOR,FIXED,FILM 30000 OHM, 10 PCT, 4 WATT FP4-3002K	(16299)		EA	1				*	*	*	*	*	C-6	A500R515
P H Y197		C	RESISTOR,FIXED,FILM 820000 OHM, 1 PCT, 1 WATT MF8CC8203F	(19701)		EA	1				*	*	*	*	*	C-6	A500R508
P H Y198	5905-213-6141	C	RESISTOR,FIXED,FILM 1.21 MEGOHMS, 1 PCT, 1/2W MF7CD1214F	(19701)		EA	2				*	*	*	*	*	C-6	A500R519

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P H Y199	5905-994-8553	C	RESISTOR,FIXED,FILM 475000 OHM, 1 PCT, 1/2W MF7CD4753F (19701)		EA	2				*	*	*	*	*	C-6	A500R502
P H Y200	5905-994-8553	C	RESISTOR,FIXED,FILM SAME AS Y199 MF7CD4753F (19701)		EA	REF				*	*	*	*	*	C-6	A500R503
P H Y201	5905-927-2876	C	RESISTOR,FIXED,FILM 392000 OHMS, 1 PCT, 1/2W MF7CD3923F (19701)		EA	2				*	*	*	*	*	C-6	A500R504
P H Y202	5905-984-7679	C	RESISTOR,FIXED,FILM 121000 OHMS, 1 PCT, 1/4W RN60D1213F (81349)		EA	3				*	*	*	*	*	C-6	A500R511
P H Y203	5905-050-7071	C	RESISTOR,VARIABLE 25000 OHM, 30 PCT, 1/8W 2100-1472 (28480)		EA	2				*	*	*	*	*	C-6	A500R512
P H Y204	5961-921-3778	C	SEMICONDUCTOR DEVICE,DIODE AXIAL LEADS, 1000 PEAK INVERSE VOLTAGE 1901-0036 (28480)		EA	2				*	*	*	*	*	C-6	A500CR501
P H Y205	5961-921-3778	C	SEMICONDUCTOR DEVICE,DIODE SAME AS Y204 1901-0036 (28480)		EA	REF				*	*	*	*	*	C-6	A500CR502
P H Y206	5935-483-3979	C	SOCKET,ELECTRON TUBE UHF, 9 PIN, 0.895 IN. OD 05-0930-02 (91662)		EA	5				*	*	*	*	*	C-6	A500XV501
P H Y207	5935-483-3979	C	SOCKET,ELECTRON TUBE SAME AS Y206 05-0930-02 (91662)		EA	REF				*	*	*	*	*	C-6	A500XV503
P H Y208	5935-478-7535	C	SOCKET,ELECTRON TUBE UHF, 7 PIN, 0.760 IN. OD 05-0730-02 (91662)		EA	4				*	*	*	*	*	C-6	A500XV502
P H Y209	5935-478-7535	C	SOCKET,ELECTRON TUBE SAME AS Y208 05-0730-02 (91662)		EA	REF				*	*	*	*	*	C-6	A500XV504
P H S Y210		B	CIRCUIT CARD ASSEMBLY 5.343 IN. X 5.000 IN. X 1.750 IN. O/A, 300 V 00618-6060 (28480)		EA	1				*	*	*	*	*	C-2	A300

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P H Y211	5910-851-7794	C	CAPACITOR,FIXED,CERAMIC DI 0.01 UF, 20 PCT, 1000 VDCW 29C214A3 (56289)		EA	4				*	*	*	*	*	C-7	A300C360
P H Y212	5910-851-7794	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y211 29C214A3 (56289)		EA	REF				*	*	*	*	*	C-7	A300C361
P H Y213	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GAS50 (56289)		EA	REF				*	*	*	*	*	C-7	A300C364
P H Y214	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GAS50 (56289)		EA	REF				*	*	*	*	*	C-7	A300C366
P H Y215	5920-804-9688	C	FUSEHOLDER SAME AS Y177 1400-0008 (28480)		EA	REF				*	*	*	*	*	C-7	A300XF301
P H Y216	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H1
P H Y217	5305-057-0526	*	SCREW,MACHINE SAME AS Y179 MS51958-30 (96906)		EA	REF				*	*	*	*	*		H1
P H Y218	5310-880-5976	*	WASHER,FLAT SAME AS Y180 MS15795-806 (96906)		EA	REF				*	*	*	*	*		H1
P H Y219	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H1
P H Y220	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H1
P O Y221	5920-199-9498	C	FUSE,CARTRIDGE 1/2 AMP, 125V 313-500 (75915)		EA	2	*	*	*	*	*	*	*	*	C-7	A300F301
P O Y222	6240-912-5186	C	LAMP,GLOW SAME AS Y184 A1C (08108)		EA	REF	*	*	*	*	*	*	*	*	C-7	A300DS301
X1 H Y223		C	PRINTED WIRING BOARD PHENOLIC, 5.543 IN. X 5.000 IN. X 0.063 THK 00618-2053 (28480)		EA	1										A300PW1

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P H Y224	5905-079-3197	C	RESISTOR,FIXED,FILM SAME AS Y186 RN60D4753F	(81349)		EA	REF				*	*	*	*	*	C-7	A300R361
P H Y225	5905-079-3197	C	RESISTOR,FIXED,FILM SAME AS Y186 RN60D4753F	(81349)		EA	REF				*	*	*	*	*	C-7	A300R362
P H Y226	5905-079-3197	C	RESISTOR,FIXED,FILM SAME AS Y186 RN60D4753F	(81349)		EA	REF				*	*	*	*	*	C-7	A300R367
P H Y227	5905-456-5251	C	RESISTOR,FIXED,FILM SAME AS Y193 MF7CD1504F	(19701)		EA	REF				*	*	*	*	*	C-7	A300R373
P H Y228	5905-492-6670	C	RESISTOR,FIXED,WIRE WOUND 8660 OHM, 3 PCT, 5W 0812-0038	(28480)		EA	1				*	*	*	*	*	C-7	A300R379
P H Y229	5905-111-6009	C	RESISTOR,FIXED,COMPOSITION 820000 OHM, 5 PCT, 1W RCR32G824JS	(81349)		EA	1				*	*	*	*	*	C-7	A300R375
P H Y230	5905-345-7675	C	RESISTOR,FIXED,FILM SAME AS Y188 MF7CD1304F	(19701)		EA	REF				*	*	*	*	*	C-7	A300R374
P H Y231	5905-043-0381	C	RESISTOR,FIXED,FILM 2210 OHMS, 1 PCT, 1/4W RN60D2211F	(81349)		EA	2				*	*	*	*	*	C-7	A300R364
P H Y232	5905-043-0381	C	RESISTOR,FIXED,FILM SAME AS Y231 RN60D2211F	(81349)		EA	REF				*	*	*	*	*	C-7	A300R366
P H Y233	5905-927-8485	C	RESISTOR,FIXED,WIRE WOUND 20 OHM, 5 PCT, 5W 243E2005	(56289)		EA	1				*	*	*	*	*	C-7	A300R360
P H Y234	5905-141-1149	C	RESISTOR,FIXED,COMPOSITION 390 OHM, 5 PCT, 1W RCR32G391JS	(81349)		EA	2				*	*	*	*	*	C-7	A300R363
P H Y235	5905-141-1149	C	RESISTOR,FIXED,COMPOSITION SAME AS Y234 RCR32G391JS	(81349)		EA	REF				*	*	*	*	*	C-7	A300R365
P H Y236		C	RESISTOR,FIXED,FILM SAME AS Y198 MF7CD1214F	(19701)		EA	REF				*	*	*	*	*	C-7	A300R371

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION SEE NUMBER / MFR PART NO	MFR CODE	(3a) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT ALW (6) DS 1-20	DS 21-50	DS 51-100	(7) GS 1-20	GS 21-50	GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P H Y237	5905-994-8537	C RESISTOR,FIXED,FILM 150000 OHMS, 1 PCT, 1/2W MF7CD1503F	(19701)		EA	2				*	*	*	*	*	C-7	A300R368
P H Y238	5905-240-4551	C RESISTOR,FIXED,WIRE WOUND 10000 OHM, 1 PCT, 5W 0811-0007	(28480)		EA	1				*	*	*	*	*	C-7	A300R372
P H Y239	5905-994-8545	C RESISTOR,FIXED,FILM 274000 OHMS, 1 PCT, 1/2W MF7CD2743F	(19701)		EA	2				*	*	*	*	*	C-7	A300R369
P H Y240	5905-994-8545	C RESISTOR,FIXED,FILM SAME AS Y239 MF7CD2743F	(19701)		EA	REF				*	*	*	*	*	C-7	A300R370
P H Y241	5905-984-7679	C RESISTOR,FIXED,FILM SAME AS Y202 RN60D1213F	(81349)		EA	REF				*	*	*	*	*	C-7	A300R377
P H Y242	5935-918-4391	C RETAINER,TUBE SOCKET PHEN, 1.015 IN. X 0.953 IN. X 0.750 IN. O/A 5040-0417	(28480)		EA	2				*	*	*	*	*	C-7	A300XV301
P H Y243	5935-918-4391	C RETAINER,TUBE SOCKET SAME AS Y242 5040-0417	(28480)		EA	REF				*	*	*	*	*	C-7	A300XV302
P H Y244	5961-950-0537	C SEMICONDUCTOR DEVICE,DIODE AXIAL LEADS, 600 PEAK INVERSE VOLTAGE 1901-0029	(28480)		EA	3				*	*	*	*	*	C-7	A300CR301
P H Y245	5961-950-0537	C SEMICONDUCTOR DEVICE,DIODE SAME AS Y244 1901-0029	(28480)		EA	REF				*	*	*	*	*	C-7	A300CR302
P H Y246	5935-856-6987	C SOCKET,ELECTRON TUBE 111-51-11-069	(71785)		EA	1				*	*	*	*	*	C-7	A300XV305
P H Y247	5935-808-9569	C SOCKET,ELECTRON TUBE 121-51-11-060	(71785)		EA	2				*	*	*	*	*	C-7	A300XV303
P H Y248	5935-808-9569	C SOCKET,ELECTRON TUBE SAME AS Y247 121-51-11-060	(71785)		EA	REF				*	*	*	*	*	C-7	A300XV304

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P H S Y249	6130-490-8923	B	CIRCUIT CARD ASSEMBLY 1000 V, 5.343 IN. X 5.000 IN. X 1.750 IN O/A 00618-6061 (28480)		EA	1				*	*	*	*	*	C-7	A400
P H Y250	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GAS50 (56289)		EA	REF				*	*	*	*	*	C-8	A400C405
P H Y251	5910-797-4909	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y172 5GAS50 (56289)		EA	REF				*	*	*	*	*	C-8	A400C406
P H Y252	5910-851-7794	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y211 29C214A3 (56289)		EA	REF				*	*	*	*	*	C-8	A400C401
P H Y253	5910-851-7794	C	CAPACITOR,FIXED,CERAMIC DI SAME AS Y211 29C214A3 (56289)		EA	REF				*	*	*	*	*	C-8	A400C402
P H Y254	5920-804-9688	C	FUSEHOLDER SAME AS Y177 1400-0008 (28480)		EA	REF				*	*	*	*	*	C-8	A400XF401
P H Y255	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H1
P H Y256	5305-057-0526	*	SCREW,MACHINE SAME AS Y179 MS51958-30 (96906)		EA	REF				*	*	*	*	*		H1
P H Y257	5310-880-5976	*	WASHER,FLAT SAME AS Y180 MS15795-806 (96906)		EA	REF				*	*	*	*	*		H1
P H Y258	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H1
P H Y259	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H1
P O Y260	5920-199-9498	C	FUSE,CARTRIDGE SAME AS Y221 313-500 (75915)		EA	REF	*	*	*	*	*	*	*	*	C-8	A400F401
P O Y261	6240-912-5186	C	LAMP,GLOW SAME AS Y184 A1C (08108)		EA	REF	*	*	*	*	*	*	*	*	C-8	A400DS401

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X1 H Y262		C	PRINTED WIRING BOARD PHENOLIC, 5.343 IN. X 5.000 IN. X 0.063 THK 00618-2054 (28480)		EA	1										A400PW1
P H Y263	5905-965-9051	C	RESISTOR,FIXED,FILM 2000 OHM, 1 PCT, 1/8W RN55D2001F (81349)		EA	2				*	*	*	*	*	C-8	A400R417
P H Y264	5905-965-9051	C	RESISTOR,FIXED,FILM SAME AS Y263 RN55D2001F (81349)		EA	REF				*	*	*	*	*	C-8	A400R418
P H Y265	5905-156-0435	C	RESISTOR,FIXED,COMPOSITION 39 OHM, 5 PCT, 2W RCR42G390JS (81349)		EA	1				*	*	*	*	*	C-8	A400R401
P H Y266	5905-057-8480	C	RESISTOR,FIXED,FILM 51.1 OHMS, 1 PCT, 1/2W MF7CD51R1F (19701)		EA	2				*	*	*	*	*	C-8	A400R415
P H Y267	5905-057-8480	C	RESISTOR,FIXED,FILM SAME AS Y266 MF7CD51R1F (19701)		EA	REF				*	*	*	*	*	C-8	A400R416
P H Y268	5905-422-4129	C	RESISTOR,FIXED,COMPOSITION 220000 OHM, 5 PCT, 2W RCR42G224JS (81349)		EA	1				*	*	*	*	*	C-8	A400R408
P H Y269	5905-058-8468	C	RESISTOR,FIXED,FILM SAME AS Y190 MF7CD5622F (19701)		EA	REF				*	*	*	*	*	C-8	A400R407
P H Y270	5905-456-5251	C	RESISTOR,FIXED,FILM SAME AS Y193 MF7CD1504F (19701)		EA	REF				*	*	*	*	*	C-8	A400R406
P H Y271	5905-456-5251	C	RESISTOR,FIXED,FILM SAME AS Y193 MF7CD1504F (19701)		EA	REF				*	*	*	*	*	C-8	A400R409
P H Y272	5905-984-7679	C	RESISTOR,FIXED,FILM SAME AS Y202 RN60D1213F (81349)		EA	REF				*	*	*	*	*	C-8	A400R414
P H Y273	5905-994-8542	C	RESISTOR,FIXED,FILM 221000 OHMS, 1 PCT, 1/2W MF7CD2213F (19701)		EA	3				*	*	*	*	*	C-8	A400R404
P H Y274	5905-994-8542	C	RESISTOR,FIXED,FILM SAME AS Y273 MF7CD2213F (19701)		EA	REF				*	*	*	*	*	C-8	A400R419

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P H Y275	5905-069-3922	C	RESISTOR,FIXED,FILM SAME AS Y195 RN60D6812F (81349)		EA	REF				*	*	*	*	*	C-8	A400R405
P H Y276	5905-989-9546	C	RESISTOR,FIXED,FILM 110000 OHMS, 1 PCT, 1/2W MF7CD1103F (19701)		EA	1				*	*	*	*	*	C-8	A400R411
P H Y277	5905-079-3197	C	RESISTOR,FIXED,FILM SAME AS Y186 RN60D4753F (81349)		EA	REF				*	*	*	*	*	C-8	A400R410
P H Y278	5905-057-8483	C	RESISTOR,FIXED,FILM 825000 OHM, 1 PCT, 1/2W MF7CD8253F (19701)		EA	2				*	*	*	*	*	C-8	A400R413
P H Y279	5905-050-7071	C	RESISTOR,VARIABLE SAME AS Y203 2100-1472 (28480)		EA	REF				*	*	*	*	*	C-8	A400R412
P H Y280	5961-902-7499	C	SEMICONDUCTOR DEVICE,DIODE SILICON, 150 PEAK INVERSE VOLTS 1N3958 (80131)		EA	2				*	*	*	*	*	C-8	A400CR401
P H Y281	5961-902-7499	C	SEMICONDUCTOR DEVICE,DIODE SAME AS Y280 1N3958 (80131)		EA	REF				*	*	*	*	*	C-8	A400CR402
P H Y282	5935-478-7535	C	SOCKET,ELECTRON TUBE SAME AS Y208 05-0730-02 (91662)		EA	REF				*	*	*	*	*	C-8	A400XV402
P H Y283	5935-478-7535	C	SOCKET,ELECTRON TUBE SAME AS Y208 05-0730-02 (91662)		EA	REF				*	*	*	*	*	C-8	A400XV404
P H Y284	5935-483-3979	C	SOCKET,ELECTRON TUBE SAME AS Y206 05-0930-02 (91662)		EA	REF				*	*	*	*	*	C-8	A400XV401
P H Y285	5935-483-3979	C	SOCKET,ELECTRON TUBE SAME AS Y206 05-0930-02 (91662)		EA	REF				*	*	*	*	*	C-8	A400XV403
P H Y286	5935-483-3979	C	SOCKET,ELECTRON TUBE SAME AS Y206 05-0930-02 (91662)		EA	REF				*	*	*	*	*	C-8	A400XV405
P H Y287	5935-257-9879	B	CONNECTOR,PLUG,ELECTRICAL 7 MALE CONTACTS, 7.5 AMP M7P (81312)		EA	1				*	*	*	*	*	C-2	P303

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P H Y288	5935-233-6728	B	CONNECTOR,RECEPTACLE,ELEC EAC301 (82389)		EA	1				*	*	*	*	*	C-3	J1
P H Y289	5935-259-2039	B	CONNECTOR,RECEPTACLE,ELEC 7 FEMALE CONTACTS, 7.5 AMPS M7S (81312)		EA	1				*	*	*	*	*	C-2	J303
P H Y290	5935-113-5091	B	COVER,ELECTRICIAL CONNECTOR AL, 0.250 IN. CABLE HOLE, 0.656 IN. OD H16 (81312)		EA	1				*	*	*	*	*	C-2	MP30
P H Y291	5355-883-8579	B	DIAL,SCALE AL, 4.937 IN. OD, 0.750 IN. ID 618840A (28480)		EA	1				*	*	*	*	*	C-3	MP2
X2 H Y292		B	DUCT,FAN CAST AL, 4.625 IN. X 4.625 IN. 00618-2048 (28480)		EA	1										MP14
P H Y293	5305-054-6670	*	SCREW,MACHINE CRES, 8-32 X 1/2 IN. LG MS51957-45 (96906)		EA	2				*	*	*	*	*		H2
P H Y294	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H2
P H Y295	5310-045-3296	*	WASHER,LOCK SAME AS Y121 MS35338-43 (96906)		EA	REF				*	*	*	*	*		H2
P O Y296	5960-557-6780	B	ELECTRON TUBE RECEIVING 6C4 (80131)		EA	2	*	*	*	*	*	*	*	*	C-2	V404
P O Y297	5960-557-6780	B	ELECTRON TUBE SAME AS Y296 6C4 (80131)		EA	REF	*	*	*	*	*	*	*	*	C-2	V504
P O Y298	5960-624-4718	B	ELECTRON TUBE VOLTAGE REGULATOR, RECEIVING OB2 (80131)		EA	1	*	*	*	*	*	*	*	*	C-2	V305
P H Y299	5960-269-3726	B	ELECTRON TUBE 1950-0004 (28480)		EA	1				*	*	*	*	*	C-4	V114
P O Y300	5960-827-8782	B	ELECTRON TUBE 12AX7A (81349)		EA	2	*	*	*	*	*	*	*	*	C-2	V303

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P O Y301	5960-827-8782	B	ELECTRON TUBE SAME AS Y300 12AX7A (81349)		EA	REF	*	*	*	*	*	*	*	*	C-2	V304
P O Y302	5960-262-0286	B	ELECTRON TUBE VOLTAGE REGULATOR TYPE 5651A (80131)		EA	2	*	*		*	*	*	*	*	C-2	V402
P O Y303	5960-262-0286	B	ELECTRON TUBE SAME AS Y302 5651A (80131)		EA	REF	*	*	*	*	*	*	*	*	C-2	V502
P O Y304	5960-269-3691	B	ELECTRON TUBE POWER PENTODE, 3.625 IN. LG 1923-0071 (28480)		EA	3	*	*	*	*	*	*	*	*	C-2	V401
P O Y305	5960-269-3691	B	ELECTRON TUBE SAME AS Y304 1923-0071 (28480)		EA	REF	*	*	*	*	*	*	*	*	C-2	V405
P O Y306	5960-269-3691	B	ELECTRON TUBE SAME AS Y304 1923-0071 (28480)		EA	REF	*	*	*	*	*	*	*	*	C-2	V501
P O Y307	5960-967-1083	B	ELECTRON TUBE AMPLIFRAME IF SHARP CUTOFF PENTODE 6EJ7EF184 (80131)		EA	2	*	*	*	*	*	*	*	*	C-2	V403
P O Y308	5960-967-1083	B	ELECTRON TUBE SAME AS Y307 6EJ7EF184 (80131)		EA	REF	*	*	*	*	*	*	*	*	C-2	V503
P O Y309	5960-088-6527	B	ELECTRON TUBE 7233 (33173)		EA	2	*	*	*	*	*	*	*	*	C-2	V301
P O Y310	5960-088-6527	B	ELECTRON TUBE SAME AS Y309 7233 (33173)		EA	REF	*	*	*	*	*	*	*	*	C-2	V302
X2 H Y311		B	EXTENSION,SUPPORT AL, 3.125 IN. X 1.063 IN. X 1.063 IN. O/A 00618-0056 (28480)		EA	2										MP24
X2 H Y312		B	EXTENSION,SUPPORT SAME AS Y311 00618-0056 (28480)		EA	REF										MP25
P H Y313	5310-934-9760	*	NUT,PLAIN,HEXAGON MS35649-204 (96906)		EA	2				*	*	*	*	*		H1

(1) SCTN ITEM CTGY MAINT CODE REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.) MFR CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT ALW (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
X2 H Y314		*	SCREW,MACHINE SAME AS Y107 11608 (73734)		EA	REF										H1
P H Y315	5310-942-5110	*	WASHER,LOCK MS35335-88 (96906)		EA	2				*	*	*	*	*		H1
P H Y316	4130-821-2447	B	FILTER,AIR CONDITIONER AL FRAME, 6.000 IN. X 6.000 IN. X 0.500 THK 3150-0005 (28480)		EA	1				*	*	*	*	*	C-2	MP5
P H Y317	5915-421-6425	B	FILTER,LINE 2.0 AMP, 1.750 IN. X 1.750 IN. X 1.750 O/A 9100-2887 (28480)		EA	1				*	*	*	*	*	C-3	FL301
P H Y318	5920-881-4636	B	FUSEHOLDER BLK PHEN, 0.685 X 2 1/64 IN. 342014 (75915)		EA	1				*	*	*	*	*	C-3	XF101
P O Y319	5920-131-9821	B	FUSE,CARTRIDGE 3 AMP, 125 VOLT, SLOW BLOW MDX3 (71400)		EA	1	*	*	*	*	*	*	*	*	C-3	F101
X2 H Y320		B	GUIDE,CIRCUIT CARD 2.563 IN. L, 0.080 IN. SLOT WIDTH 0403-0150 (28480)		EA	6										MP7
X2 H Y321		B	GUIDE,CIRCUIT CARD SAME AS Y320 0403-0150 (28480)		EA	REF										MP8
X2 H Y322		B	GUIDE,CIRCUIT CARD SAME AS Y320 0403-0150 (28480)		EA	REF										MP9
X2 H Y323		B	GUIDE,CIRCUIT CARD SAME AS Y320 0403-0150 (28480)		EA	REF										MP10
X2 H Y324		B	GUIDE,CIRCUIT CARD SAME AS Y320 0403-0150 (28480)		EA	REF										MP11
X2 H Y325		B	GUIDE,CIRCUIT CARD SAME AS Y320 0403-0150 (28480)		EA	REF										MP12

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P H Y326	7440-019-4686	B	IMPELLER,FAN,AXIAL 0-443-4 (06812)		EA	1				*	*	*	*	*	C-2	B2
P H Y327		B	MOTOR,ALTERNATING,CURRENT 3470 RPM, 115 VOLTS, 60 CY PER SECOND M14L1-4R3 (16228)		EA	1				*	*	*	*	*	C-2	B1
X2 H Y328		B	NUT,PLAIN,HEXAGON BRS, NP, 3/8-32, 0.438 IN. OD X 0.250 IN. ID 1510NUT (88245)		EA	1										H1
A H S Y329		B	PANEL ASSEMBLY,FRONT 16.687 IN. X 13.313 IN. X 3.875 IN. O/A 00618-620 (28480)		EA	1										A2
X2 H Y330		*	SCREW,MACHINE SAME AS Y107 11608 (73734)		EA	REF										H8
P H Y331	5310-125-6170	*	WASHER,FLAT MS15795-942 (96906)		EA	8				*	*	*	*	*		H8
P H Y332	6625-998-6521	C	AMMETER SCALE 0 TO 181 MICROAMP, DC RES 360 OHMS 1120-1277 (28480)		EA	1				*	*	*	*	*	C-9	A2M101
P H Y333	5985-833-2427	C	ATTENUATOR ASSY,FIXED 29.000 IN. O/A LENGTH 618834AA (28480)		EA	1				*	*	*	*	*	C-9	A2AT1
P H Y334	5340-203-0375	C	BUSHING,SLEEVE BRASS, 3/8-32 THD, 0.500 IN. OD, 0.094 THK 1410-0003 (28480)		EA	5				*	*	*	*	*	C-9	A2MP42
P H Y335	5340-203-0375	C	BUSHING,SLEEVE SAME AS Y334 1410-0003 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP43
P H Y336	5340-203-0375	C	BUSHING,SLEEVE SAME AS Y334 1410-0003 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP44
P H Y337	5340-203-0375	C	BUSHING,SLEEVE SAME AS Y334 1410-0003 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP45

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P H Y338	5340-203-0375	C	BUSHING,SLEEVE SAME AS Y334 1410-0003 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP46
P H Y339	5935-920-7094	C	CAP,ELECTRICAL BRASS, 0.562 IN. L, 0.687 IN. OD 08614-227 (28480)		EA	1				*	*	*	*	*	C-3	A2P1
P H Y340	5935-931-0420	*	CAP,ELECTRICAL 0.875 IN. L X 0.780 IN. OD, LEAD 2.750 IN. L 5020-0306 (28480)		EA	1				*	*	*	*	*		H1
P H S Y341	6625-998-6530	C	CIRCUIT CARD ASSEMBLY 4.474 IN. X 1.875 IN. X 0.875 IN. O/A 00618-632 (28480)		EA	1				*	*	*	*	*	C-9	A2A600
X1 H Y342		D	PRINTED WIRING BOARD PHENOLIC, 4.474 IN. X 1.875 IN. X 0.063 THK 00618-223 (28480)		EA	1										A2A600PW1
P H Y343	5905-965-9049	D	RESISTOR,FIXED,FILM 20000 OHM, 1 PCT, 1/8W RN55D2002F (81349)		EA	1				*	*	*	*	*	C-10	A2A600R609
P H Y344	5905-994-8542	D	RESISTOR,FIXED,FILM SAME AS Y273 MF7CD2213F (19701)		EA	REF				*	*	*	*	*	C-10	A2A600R610
P H Y345	5905-994-8537	D	RESISTOR,FIXED,FILM SAME AS Y237 MF7CD1503F (19701)		EA	REF				*	*	*	*	*	C-10	A2A600R608
P H Y346	5905-057-8495	D	RESISTOR,FIXED,FILM 130000 OHMS, 1 PCT, 1/2W MF7CD1303F (19701)		EA	1				*	*	*	*	*	C-10	A2A600R611
P H Y347	5905-068-4287	D	RESISTOR,FIXED,FILM 4750 OHM, 1 PCT, 1/8W RN55D4751F (81349)		EA	2				*	*	*	*	*	C-10	A2A600R604
P H Y348	5905-068-4287	D	RESISTOR,FIXED,FILM SAME AS Y347 RN55D4751F (81349)		EA	REF				*	*	*	*	*	C-10	A2A600R605
P H Y349	5905-734-4083	D	RESISTOR,FIXED,FILM 24300 OHM, 1 PCT, 1/8W RN55D2432F (81349)		EA	1				*	*	*	*	*	C-10	A2A600R607

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P H Y350	5905-889-0226	D	RESISTOR,FIXED,FILM 6810 OHM, 1 PCT, 1/8W RN55D6811F (81349)		EA	1				*	*	*	*	*	C-10	A2A600R606
P H Y351	5905-728-1659	D	RESISTOR,FIXED,FILM 1500 OHM, 1 PCT, 1/8W RN55D1501F (81349)		EA	1				*	*	*	*	*	C-10	A2A600R603
P H Y352	5905-931-6981	D	RESISTOR,VARIABLE PARALLEL LEADS, 500 OHM, 5 PCT, 1W 2100-0898 (28480)		EA	1				*	*	*	*	*	C-10	A2A600R612
P H Y353	5961-858-7372	D	SEMICONDUCTOR DEVICE,DIODE 5.11 V, 5 PCT, 400 MW 1902-0041 (28480)		EA	1				*	*	*	*	*	C-10	A2A600CR601
P H Y354	5961-978-7468	D	SEMICONDUCTOR DEVICE,DIODE SILICON, JUNCTION, SELECTED 1901-0025 (28480)		EA	1				*	*	*	*	*	C-10	A2A600CR602
P H Y355	5365-161-9382	D	SPACER,SLEEVE BRS, CAD PL, 0.218 IN. L X 0.250 IN. OD 0380-0114 (28480)		EA	1				*	*	*	*	*	C-10	A2A600MP1
P H Y356	5961-836-1887	D	TRANSISTOR SILICON, NPN, DUAL, 0.4W EACH SIDE 1854-0221 (28480)		EA	2				*	*	*	*	*	C-10	A2A600Q601
P H Y357	5961-836-1887	D	TRANSISTOR SAME AS Y356 1854-0221 (28480)		EA	REF				*	*	*	*	*	C-10	A2A600Q602
P H Y358	5961-990-5369	D	TRANSISTOR SILICON, NPN, VCEO 28V, 3W 1854-0003 (28480)		EA	1				*	*	*	*	*	C-10	A2A600Q603
P H Y359	6625-998-6523	C	CONTACT,ELECTRIC BRS, 0.960 IN. OD 618B3G (28480)		EA	2				*	*	*	*	*	C-9	A2E3
P H Y360	6625-998-6523	C	CONTACT,ELECTRIC SAME AS Y359 618B3G (28480)		EA	REF				*	*	*	*	*	C-9	A2E4
A H S Y361		C	CONTROL ASSEMBLY,FREQUENCY 9.250 IN. X 6.375 IN. X 5.875 IN. O/A 00618-622 (28480)		EA	1									C-9	A2A4

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P H Y362	5305-071-1322	*	SCREW,MACHINE MS51960-65 (96906)		EA	1				*	*	*	*	*		H1
X2 H Y363		*	SCREW,MACHINE CAD PL STL, TRH, 10-24 X 0.500 IN. L 4233 (73734)		EA	7										H3
P H Y364	5930-755-2005	D	ACTUATOR,SWITCH 0.750 IN. X 1.920 IN. X 1.940 IN. O/A DIM JR (91929)		EA	1				*	*	*	*	*	C-11	A2A4MP56
P H Y365	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H2
P H Y366	5305-054-6661	*	SCREW,MACHINE MS51957-37 (96906)		EA	8				*	*	*	*	*		H2
P H Y367	5310-880-5976	*	WASHER,FLAT SAME AS Y180 MS15795-806 (96906)		EA	REF				*	*	*	*	*		H2
P H Y368	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H2
P H Y369	5330-579-3663	*	WASHER,NONMETALLIC 2150 (83330)		EA	4				*	*	*	*	*		H4
X2 H Y370		D	ADAPTER,TUBE SIL PLD BRS, 1.062 IN. L, 0.437 IN. OD 00618-238 (28480)		EA	1										A2A4MP52
X2 H Y371		D	BAR,GUIDE AL, 4.875 IN. X 0.250 IN. X 0.250 IN. O/A 618836AD (28480)		EA	1										A2A4X1
P H Y372	5305-054-6658	*	SCREW,MACHINE MS51957-34 (96906)		EA	11				*	*	*	*	*		H3
P H Y373	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H3

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M D Y374		D	BAR,PLUNGER AL, 3.500 IN. X 0.750 IN. X 0.500 IN. O/A 618B36G (28480)		EA	1										A2A4MP27
X2 H Y375		D	BEARING,BALL,ANNULAR 1410-0009 (28480)		EA	2										A2A4MP47
X2 H Y376		D	BEARING,BALL,ANNULAR SAME AS Y375 1410-0009 (28480)		EA	REF										A2A4MP48
P H Y377	5910-797-9731	D	CAPACITOR,FIXED,PAPER 0.25 UF, 10 PCT, 1500 VDCW 0160-0088 (28480)		EA	2				*	*	*	*	*	C-11	A2A4C136
A H S Y378		D	CAVITY,CONTROL ASSEMBLY CAST AL, 7.750 IN. X 4.250 IN. X 1.750 IN. 00618-2061 (28480)		EA	1										A2A4MP54
P H Y379	5305-054-6658	*	SCREW,MACHINE SAME AS Y372 MS51957-34 (96906)		EA	REF				*	*	*	*	*		H6
P H Y380	3040-127-2837	D	COLLAR,SHAFT BRS, SIL PLD, 0.625 IN. OD, 0.375 IN. ID 5020-0233 (28480)		EA	6				*	*	*	*	*	C-11	A2A4MP39
P H Y381	3040-127-2837	D	COLLAR,SHAFT SAME AS Y380 5020-0233 (28480)		EA	REF				*	*	*	*	*	C-11	A2A4MP40
P H Y382	6625-877-0280	D	CONDUCTOR ASSEMBLY,CENTER BRASS, 4.375 IN. L, 0.781 IN. OD 618B36Z (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP34
X2 H Y383		D	COUPLER,POTIENTOMETER AL, 1.250 IN. X 1.000 IN. X 0.093 IN. O/A 00618-242 (28480)		EA	1										A2A4MP51
X2 H Y384		D	COVER PLATE,DRIVE MECHANISM 5.687 IN. X 5.000 IN. X 0.156 IN. THK 620A36BB (28480)		EA	1										A2A4MP1
P H Y385	5305-057-0526	*	SCREW,MACHINE SAME AS Y179 MS51958-30 (96906)		EA	REF				*	*	*	*	*		H4

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P H Y386	5310-905-9862	*	WASHER,LOCK MS35336-56 (96906)		EA	4				*	*	*	*	*		H4
X2 H Y387		D	DRIVE SCREW ASSEMBLY 8.000 IN. LG 00618-204 (28480)		EA	1										A2A4MP55
P H Y388	6625-031-1004	D	FILTER REPELLER ASSEMBLY BRASS, 7.000 IN. TOTAL LENGTH 618B36AK (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP9
P H Y389	5915-793-0226	D	FILTER,LOW PASS 4.000 IN. L X 0.375 IN. OD 618B27 (28480)		EA	1				*	*	*	*	*	C-11	A2A4FL1
P H Y390	6625-588-0884	D	GEAR,HELICAL BRS, OFS T, 35 T, PITCH DIA 1.188 IN. 5020-0278 (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP38
P H Y391	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H1
P H Y392	5310-019-0670	*	WASHER,LOCK MS35333-106 (96906)		EA	1				*	*	*	*	*		H1
P H Y393	3020-594-0541	D	GEAR,SPUR BRASS, 32 TEETH, 1.062 IN. OD, 0.593 IN. L 618B36AX (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP13
X2 H Y394		E	PIN,DRIVE LOCK 0.312 IN. X 0.078 IN. 1480-0058 (28480)		EA	1										A2A4MP13H7
P H Y395	3020-594-0541	D	GEAR,SPUR 618B36P (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP31
P H Y396	3020-660-0792	D	GEAR,SPUR 618B36R (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP33
P H Y397	3020-594-0533	D	GEAR,SPUR 618B36N (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP30

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P H Y398	3020-600-7082	D	GEAR,SPUR BRASS, 3.562 IN. X 0.281 IN. X 0.093 IN. O/A 618B36Q (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP32
X2 H Y399		D	GUIDE,FREQUENCY CONTROL STEEL, 0.593 IN. L, 0.310 IN. OD X 0.213 ID 618B36D (28480)		EA	2										A2A4MP15
X2 H Y400		D	GUIDE,FREQUENCY CONTROL SAME AS Y399 618B36D (28480)		EA	REF										A2A4MP16
X2 H Y401		D	HOUSING,MECHANICAL DRIVE AL, 7.000 IN. X 6.000 IN. X 4.750 IN. O/A 620A36AA (28480)		EA	1										A2A4MP2
X2 H Y402		D	PLATE,BACK AL, 3.750 IN. X 1.750 IN. X 0.250 IN. O/A 618B36AA (28480)		EA	1										A2A4MP3
X2 H Y403		D	PLATE,MOUNTING PH BRZ, 2.250 IN. OD X 1.250 IN. ID 618B36AT (28480)		EA	3										A2A4MP10
X2 H Y404		D	PLATE,MOUNTING SAME AS Y403 618B36AT (28480)		EA	REF										A2A4MP11
X2 H Y405		D	PLATE,MOUNTING SAME AS Y403 618B36AT (28480)		EA	REF										A2A4MP12
P H Y406	5305-054-6661	*	SCREW,MACHINE SAME AS Y366 MS51957-37 (96906)		EA	REF				*	*	*	*	*		H2
P H Y407	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H2
P H Y408	5340-470-0726	D	PLUNGER ASSEMBLY 618B36BC (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP14
X2 H Y409		D	POST,ELECTROMECHANICAL PH BRZ, 0.750 IN. L, 0.250 IN. OD 618B36AJ (28480)		EA	2										A2A4MP7

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X2 H Y410		D	POST,ELECTROMECHANICAL SAME AS Y409 618836AJ (28480)		EA	REF										A2A4MP8
P H Y411	5905-615-3254	D	RESISTOR,VARIABLE WIRE WOUND BAKELITE CASE, 100000 OHM, 10 PCT, 8W 2100-0127 (28480)		EA	1				*	*	*	*	*	C-11	A2A4R174
X2 H Y412		D	RETAINER,BALL BEARING BRASS, 1.500 IN. OD X 0.562 IN. ID 618836L (28480)		EA	2										A2A4MP28
X2 H Y413		D	RETAINER,BALL BEARING SAME AS Y412 618836L (28480)		EA	REF										A2A4MP29
P H Y414	5305-958-5453	*	SCREW,MACHINE MS35190-236 (96906)		EA	4				*	*	*	*	*		H2
P H Y415	5910-519-6048	D	RETAINER,CAPACITOR CP07FA2 (81349)		EA	2				*	*	*	*	*	C-11	A2A4MP57
P H Y416	5910-519-6048	D	RETAINER,CAPACITOR SAME AS Y415 CP07FA2 (81349)		EA	REF				*	*	*	*	*	C-11	A2A4MP58
P H Y417	5305-054-6652	*	SCREW,MACHINE MS51957-28 (96906)		EA	2				*	*	*	*	*		H1
P H Y418	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H1
X2 H Y419		D	ROD,CONNECTING STL, 3.437 IN. X 0.500 IN. X 0.093 IN. O/A 618836E (28480)		EA	4										A2A4MP19
X2 H Y420		D	ROD,CONNECTING SAME AS Y419 618836E (28480)		EA	REF										A2A4MP20
P H Y421	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H1

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P H Y422	5305-054-6658	*	SCREW,MACHINE SAME AS Y372 MS51957-34 (96906)		EA	REF				*	*	*	*	*		H1
P H Y423	5310-880-5976	*	WASHER,FLAT SAME AS Y180 MS15795-806 (96906)		EA	REF				*	*	*	*	*		H2
P H Y424	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H2
X2 H Y425		D	ROD,CONNECTING SAME AS Y419 618836E (28480)		EA	REF										A2A4MP17
X2 H Y426		D	ROD,CONNECTING SAME AS Y419 618836E (28480)		EA	REF										A2A4MP18
P H Y427	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H2
P H Y428	5310-880-5976	*	WASHER,FLAT SAME AS Y180 MS15795-806 (96906)		EA	REF				*	*	*	*	*		H2
P H Y429	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H2
X2 H Y430		D	SHAFT CRES, 2.750 IN. L,X 0.250 IN. DIA 5020-0349 (28480)		EA	1										A2A4MP37
X2 H Y431		D	SHAFT SST ROD, 1.312 IN. L X 0.265 IN. DIA 5020-0340 (28480)		EA	1										A2A4MP36
X2 H Y432		D	SPACER,CONNECTING ROD STL, 0.500 IN. X 0.250 IN. X 0.125 IN. O/A 618836F (28480)		EA	6										A2A4MP21
X2 H Y433		D	SPACER,CONNECTING ROD SAME AS Y432 618836F (28480)		EA	REF										A2A4MP22
X2 H Y434		D	SPACER,CONNECTING ROD SAME AS Y432 618836F (28480)		EA	REF										A2A4MP23

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X2 H Y435		D	SPACER,CONNECTING ROD SAME AS Y432 6188 36F (28480)		EA	REF										A2A4MP24
X2 H Y436		D	SPACER,CONNECTING ROD SAME AS Y432 6188 36F (28480)		EA	REF										A2A4MP25
X2 H Y437		D	SPACER,CONNECTING ROD SAME AS Y432 6188 36F (28480)		EA	REF										A2A4MP26
X2 H Y438		D	SPACER,SLEEVE 1.125 IN. LG X 0.250 IN. OD 0380-0014 (28480)		EA	2										A2A4MP49
X2 H Y439		D	SPACER,SLEEVE SAME AS Y438 0380-0014 (28480)		EA	REF										A2A4MP50
X2 H Y440		D	SPACER,SLEEVE AL, 0.312 IN. L X 0.250 IN. OD X 0.140 IN ID 6188 36AE (28480)		EA	3										A2A4MP4
X2 H Y441		D	SPACER,SLEEVE SAME AS Y440 6188 36AE (28480)		EA	REF										A2A4MP5
X2 H Y442		D	SPACER,SLEEVE SAME AS Y440 6188 36AE (28480)		EA	REF										A2A4MP6
P H Y443	6625-607-1516	D	SPACER,STEPPED 608D47J (28480)		EA	1				*	*	*	*	*	C-11	A2A4MP35
X2 H Y444		D	SPRING,HELICAL,EXTENSION MUSIC WIRE, 1.875 IN. L, 0.187 IN. OD 1678 (02732)		EA	2										A2A4MP41
X2 H Y445		D	SPRING,HELICAL,EXTENSION SAME AS Y444 1678 (02732)		EA	REF										A2A4MP42
X2 H Y446		*	SCREW,MACHINE SST, RDH, 6-32 X 0.250 IN. L 22042 (73734)		EA	4										H2

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P H Y447	5360-594-0409	D	SPRING,HELICAL,EXTENSION STEEL WIRE, CAD PL, 0.687 IN. L 1460-0048 (28480)		EA	8				*	*	*	*	*	C-11	A2A4MP43
P H Y448	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-11	A2A4MP44
P H Y449	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-11	A2A4MP45
P H Y450	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-11	A2A4MP46
P H Y451	5930-548-7764	D	SWITCH,SENSITIVE SPDT, 1.940 IN. X 1.140 IN. X 0.687 IN. O/A BZ2RS (91929)		EA	1				*	*	*	*	*	C-11	A2A4S103
X2 H Y452		D	TUBE,ATTENUATOR BRASS, 3.125 IN. LG W/ 2 EA. 0.152 DIA HOLES 00618-2059 (28480)		EA	1										A2A4MP53
X2 H Y453		D	WASHER,SPRING TENSION EXT TOOTH, 1.000 IN. OD X 0.750 IN. ID 00618-2058 (28480)		EA	1										A2A4H1
X2 H Y454	3010-891-4197	C	COUPLING,SHAFT,RIGID 0.812 IN. L, 0.750 IN. OD 5020-0238 (28480)		EA	10										A2MP31
X2 H Y455	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP32
X2 H Y456	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP33
X2 H Y457	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP34
X2 H Y458	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP35

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X2 H Y459	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP36
X2 H Y460	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP37
X2 H Y461	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP38
X2 H Y462	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP39
X2 H Y463	3010-891-4197	C	COUPLING,SHAFT,RIGID SAME AS Y454 5020-0238 (28480)		EA	REF										A2MP40
P H Y464	5355-401-3243	C	COVER,DIAL AL, 5.500 IN. OD X 0.562 IN. WIDE 618B408 (28480)		EA	1				*	*	*	*	*	C-3	A2MP4
X2 H Y465		*	SCREW,MACHINE SST, PHH, 4-40 X 0.750 IN. L 22028 (73734)		EA	4										H4
P H Y466	5355-788-6925	C	COVER,HUB AL, 1.593 IN. X 0.312 IN. 61840B1 (28480)		EA	1				*	*	*	*	*	C-12	A2MP16
P H Y467	6625-406-4318	C	DETECTOR ASSEMBLY 3.000 IN. X 1.000 IN. X 1.000 IN. O/A 00618-628 (28480)		EA	1				*	*	*	*	*	C-9	A2A6
P H Y468	5305-958-5473	*	SCREW,MACHINE MS35190-251 (96906)		EA	3				*	*	*	*	*		H2
P H Y469	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H2
P H Y470	5355-816-8372	C	DIAL,CONTROL AL, 1.750 IN. OD, FOR PULSE DELAY 618840F (28480)		EA	1				*	*	*	*	*	C-12	A2MP7
P H Y471	5355-401-3244	C	DIAL,CONTROL AL, 3.500 IN. OD, INDICATES POWER SET 618840E (28480)		EA	1				*	*	*	*	*	C-12	A2MP6

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P H Y472	5355-816-8374	C	DIAL,CONTROL AL DIAL, PHEN KNOB, 1.750 IN. OD, FOR PLS LG 618840H (28480)		EA	1				*	*	*	*	*	C-12	A2MP9
P H Y473	5355-816-8373	C	DIAL,CONTROL AL DIAL, PHEN KNOB, 1.750 IN. OD, PULSE RATE 618840G (28480)		EA	1				*	*	*	*	*	C-12	A2MP8
P H Y474	5355-401-3245	C	DIAL,CONTROL AL DIAL, PLSTC KNOB, FOR FREQ VERN 618840P (28480)		EA	1				*	*	*	*	*	C-12	A2MP10
X2 H Y475		C	DIAL,SCALE AL, 618840Q (28480)		EA	1										A2MP11
P H Y476	6625-031-1006	C	DIAL,SCALE AL/BRS, 3.000 IN. OD 618840C (28480)		EA	1				*	*	*	*	*	C-12	A2MP5
A H S Y477		C	DRIVE ASSEMBLY,ATTENUATOR 618835 (28480)		EA	1									C-9	A2A1
P H Y478	5305-957-6640	*	SCREW,MACHINE MS35190-259 (96906)		EA	3				*	*	*	*	*		H3
P H Y479	3110-930-2478	D	BEARING,BALL,ANNULAR RADIAL, 0.500 IN. OD, 0.1562 IN. WIDTH 33K5FS58115 (86174)		EA	2				*	*	*	*	*	C-13	A2A1MP30
P H Y480	3110-930-2478	D	BEARING,BALL,ANNULAR SAME AS Y479 33K5FS58115 (86174)		EA	REF				*	*	*	*	*	C-13	A2A1MP31
P H Y481	3110-044-4155	D	BEARING,BALL,ANNULAR RADIAL, DOUBLE SHIELD, 0.2812 IN. WIDE S1KDD7FS58115 (86174)		EA	1				*	*	*	*	*	C-13	A2A1MP36
P H Y482	3110-068-0067	D	BEARING,BALL,ANNULAR RADIAL, DOUBLE SHIELD, 0.2812 IN. WIDE S3KDDFS58115 (86174)		EA	2				*	*	*	*	*	C-13	A2A1MP37
P H Y483	3110-068-0067	D	BEARING,BALL,ANNULAR SAME AS Y482 S3KDDFS58115 (86174)		EA	REF				*	*	*	*	*	C-13	A2A1MP38

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M D Y484		D	BRACKET,ANGLE AL, 2.625 IN. X 0.406 IN. X 0.375 IN. O/A 618B47A (28480)		EA	1										A2A1MP3
X2 H Y485		*	SCREW,MACHINE SST, RDH, 6-32 X 0.375 IN. L 22044 (73734)		EA	2										H2
P H Y486	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H2
X2 H Y487		D	BRACKET,MOUNTING,GEAR AL, 0.875 IN. X 0.750 IN. X 0.156 IN. O/A 618B35H (28480)		EA	1										A2A1MP9
X2 H Y488		D	BUSHING,SLEEVE SIL PLD BRS, 0.625 IN. OD, 0.313 IN. L 624B59C5 (28480)		EA	1										A2A1MP1
P H Y489	3040-127-2837	D	COLLAR,SHAFT SAME AS Y380 5020-0233 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP26
P H Y490	3040-127-2837	D	COLLAR,SHAFT SAME AS Y380 5020-0233 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP27
P H Y491	3040-127-2837	D	COLLAR,SHAFT SAME AS Y380 5020-0233 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP28
P H Y492	3040-127-2837	D	COLLAR,SHAFT SAME AS Y380 5020-0233 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP29
P H Y493	6625-594-0458	D	DRIVESHAFT,HUB BRASS, 3.500 IN. L W/ SOLDERED HUB 618B35E (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP7
P H Y494	3020-031-1019	D	GEAR RACK BRASS, 2.312 IN. X 0.125 IN. X 0.125 IN. O/A 618B35PS (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP17
P H Y495	5305-860-1749	*	SCREW,MACHINE MS35199-10 (96906)		EA	2				*	*	*	*	*		H1

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P H Y496	3020-031-1018	D	GEAR RACK BRASS, 3.625 IN. LONG 618B35PL (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP16
P H Y497	5305-860-1749	*	SCREW,MACHINE SAME AS Y495 MS35199-10 (96906)		EA	REF				*	*	*	*	*		H1
X2 H Y498	3020-594-0560	D	GEAR,SPUR BRASS, 16 TEETH, 0.562 IN. OD X 0.437 IN. L 618B35U (28480)		EA	1										A2A1MP22
X2 H Y499		D	GEAR,SPUR BRASS, 112 TEETH, 3.625 IN. OD 618B35M (28480)		EA	1										A2A1MP14
P H Y500	6625-589-9680	D	GEAR,SPUR BRASS, 16 TEETH, 0.421 IN. OD X 0.531 IN. L 618B35V (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP23
P H Y501	3020-600-7084	D	GEAR,SPUR BRASS, 112 TEETH, PITCH DIA 3.500 618B35K (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP12
P H Y502	3020-594-0555	D	GEAR,SPUR BRASS, 32 TEETH, 1.062 IN. OD X 1.000 IN. L 618B35S (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP20
P H Y503	3020-594-0552	D	GEAR,SPUR BRASS, 36 TEETH, 1.062 IN. X 0.437 IN. 618B35Q (26480)		EA	1				*	*	*	*	*	C-13	A2A1MP18
P H Y504	3020-593-5141	D	GEAR,SPUR BRASS, 36 TEETH, 0.812 IN. OD X 0.500 IN. L 618B35T (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP21
P H Y505	3020-600-7080	D	GEAR,SPUR BRASS, 112 TEETH, 3.625 IN. OD, 0.078 IN THK 618B35N (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP15
P H Y506	3020-831-5994	D	GEAR,SPUR BRASS, 36 TEETH, 0.796 IN. OD X 0.437 IN. L 618B35R (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP19

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P H Y507	3020-600-0794	D	GEAR,SPUR BRS, 3.625 IN. OD, 112 TEETH, 32 PITCH 618B35L (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP13
X2 H Y508		D	HOUSING,MECHANICAL DRIVE ZINC, 5.250 IN. X 4.250 IN. X 2.250 IN. O/A 618B35A (28480)		EA	1										A2A1MP4
P H Y509	4920-382-9486	D	HUB,GEAR BRASS, 1.250 IN. OD X 0.250 IN. W 618B35G (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP8
X2 H Y510		D	RETAINER,GEAR RACK ZINC, 1.875 IN. X 0.750 IN. 618B35B (28480)		EA	1										A2A1MP5
X2 H Y511		D	SHAFT,SHOULDERED SST, 4.625 IN. L, OD 0.250 AND 0.187 INCHES 618B35I (28480)		EA	1										A2A1MP10
X2 H Y512		D	SHAFT,STRAIGHT SST, 3.125 IN. L, 0.250 IN. DIA 5020-0256 (28480)		EA	2										A2A1MP24
X2 H Y513		D	SHAFT,STRAIGHT SAME AS Y512 5020-0256 (28480)		EA	REF										A2A1MP25
X2 H Y514		D	SHAFT,STRAIGHT SST, 3.375 IN. L 618B35J (28480)		EA	1										A2A1MP11
X2 H Y515		D	SPACER,SLEEVE BRS, 0.875 IN. X 0.750 IN. OD X 0.625 IN. ID 618B35D (28480)		EA	1										A2A1MP6
P H Y516	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP32
P H Y517	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP33
P H Y518	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP34

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P H Y519	5360-594-0409	D	SPRING,HELICAL,EXTENSION SAME AS Y447 1460-0048 (28480)		EA	REF				*	*	*	*	*	C-13	A2A1MP35
P H Y520	6625-034-6690	D	SPRING,RACK LOAD BRONZE, 0.750 IN. X 0.240 IN. X 0.016 IN THK 620A91A (28480)		EA	1				*	*	*	*	*	C-13	A2A1MP2
P H Y521	5310-930-2722	D	WASHER,LOCK COPPER, 0.562 IN. OD X 0.281 IN. ID 5000-0206 (28480)		EA	9				*	*	*	*	*		A2A1H4
X2 H Y522		C	GUIDE,RETAINER AL, 0.875 IN. X 0.375 IN. X 0.593 IN. O/A 618B3A (28480)		EA	1										A2MP15
P H Y523	6625-406-4332	C	HANDLE,BOW SST, 10.562 IN X 0.375 IN. DIA 618B3E (28480)		EA	2				*	*	*	*	*	C-12	A2MP12
P H Y524	6625-406-4332	C	HANDLE,BOW SAME AS Y523 618B3E (28480)		EA	REF				*	*	*	*	*	C-12	A2MP13
P H Y525	6625-565-9963	*	FERRULE,HANDLE BRS, SIL PL, 0.750 IN. L X 0.750 IN. OD 6183AT (28480)		EA	4				*	*	*	*	*		H2
X2 H Y526		*	SCREW,MACHINE SAME AS Y363 4233 (73734)		EA	REF										H2
P H Y527	6625-445-6775	C	HUB BRS, 0.746 IN. ID X 1.000 IN. OD 5020-0234 (28480)		EA	1				*	*	*	*	*	C-12	A2MP30
P H Y528	5305-958-5473	*	SCREW,MACHINE SAME AS Y468 MS35190-251 (96906)		EA	REF				*	*	*	*	*		H1
P H Y529	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H1
P O Y530	5355-646-4704	C	KNOB PHENOLIC, 1.000 IN. OD 0370-0029 (28480)		EA	2	*	*	*	*	*	*	*	*	C-12	A2MP48

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P O Y531	5355-646-4704	C	KNOB SAME AS Y530 0370-0029 (28480)		EA	REF	*	*	*	*	*	*	*	*	C-12	A2MP49
P O Y532	5355-543-0066	C	KNOB BLK PHEN, 0.734 IN. L, 1.625 IN. OD 0370-0038 (28480)		EA	2	*	*	*	*	*	*	*	*	C-12	A2MP52
P O Y533	5355-543-0066	C	KNOB SAME AS Y532 0370-0038 (28480)		EA	REF	*	*	*	*	*	*	*	*	C-12	A2MP53
P O Y534	5355-547-7996	C	KNOB PHENOLIC, 1.625 IN. X 0.750 IN. X 1.000 OD 0370-0035 (28480)		EA	2	*	*	*	*	*	*	*	*	C-12	A2MP50
P O Y535	5355-547-7996	C	KNOB SAME AS Y534 0370-0035 (28480)		EA	REF	*	*	*	*	*	*	*	*	C-12	A2MP51
P O Y536	5355-579-2318	C	KNOB BLK PHEN, 0.500 IN. L X 0.375 IN. OD 0370-0050 (28480)		EA	1	*	*	*	*	*	*	*	*	C-12	A2MP54
P H Y537	6625-877-0281	C	NUT, SELFLOCKING, HEX 61883C (28480)		EA	1				*	*	*	*	*		A2H1
X2 H Y538		C	PANEL, BLANK 16.687 IN. X 13.313 IN. 00618-020 (28480)		EA	1										A2MP58
M H Y539		C	PLATE, INDENTIFICATION AL FOIL, 2.187 IN. X 0.875 IN. X 0.020 THK 7120-1269 (28480)		EA	1										A2E1
P H Y540	6625-772-6119	C	PLATE, MOUNTING, DIAL AL, 1.125 IN. OD X 0.093 IN. THK 6184004 (28480)		EA	1				*	*	*	*	*	C-12	A2MP18
P H Y541	5305-957-6645	*	SCREW, MACHINE MS35190-233 (96906)		EA	4				*	*	*	*	*		H4
P H Y542	5340-818-5973	C	POST, ELECTROMECHANICAL 1410-0033 (28480)		EA	1				*	*	*	*	*	C-12	A2MP41

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P H Y543	6625-998-6522	C	PROBE ASSEMBLY 00618-640 (28480)		EA	1				*	*	*	*	*	C-9	A2A3
P H Y544	5935-111-6192	D	BEAD,CONNECTOR 5040-0214 (28480)		EA	1				*	*	*	*	*	C-14	A2A3MP3
X2 H Y545		D	BODY,CONNECTOR 1250-0141 (28480)		EA	2										A2A3MP4
X2 H Y546		D	BODY,PROBE BRASS, 2.380 IN. L, 0.375 IN. OD 00618-231 (28480)		EA	1										A2A3MP5
P H Y547	5365-453-6642	D	BUSHING,MACHINE THREAD BRS, SIL PLD, 3-8 X 32 X 0.312 IN. L 1250-0005 (28480)		EA	2				*	*	*	*	*	C-14	A2A3MP6
P H Y548	5975-931-4820	D	BUSHING,MACHINE THREAD SIL PLD BRS, 7/16 X 32, 0.437 IN. OD 1250-0142 (28480)		EA	2				*	*	*	*	*	C-14	A2A3MP7
P H Y549	5935-824-7685	D	CONNECTOR,RECEPTACLE,ELEC BRS, 1.562 IN. L, 0.875 IN. OD 1250-0144 (28480)		EA	1				*	*	*	*	*	C-14	A2A3J106
P H Y550	5999-463-9891	D	CONTACT,ELECTRIC 1250-1026 (28480)		EA	1				*	*	*	*	*	C-14	A2A3E2
P H Y551	5330-973-8288	D	GASKET RBR, 0.390 IN. OD 1250-0145 (28480)		EA	2				*	*	*	*	*	C-14	A2A3MP2
P H Y552	6625-650-4953	D	GASKET 88-35 (91737)		EA	2				*	*	*	*	*	C-14	A2A3MP1
P H Y553	5970-933-4602	D	INSULATOR,WASHER RESIN, 0.437 IN. OD, 0.046 IN. THK 1250-0148 (28480)		EA	2				*	*	*	*	*	C-14	A2A3E1
X2 H Y554		D	NUT,RETIANING SIL PLD BRS, 9/16-24, 0.484 IN. OD 1250-0147 (28480)		EA	2										A2A3H4
X2 H Y555		D	TERMINATION,PROBE GLASS, 0.110 IN. X 0.080 IN. X 0.055 IN. O/A 00618-2056 (28480)		EA	2										A2A3E3

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P H Y556	5935-937-4421	D	WASHER,CLAMP SIL PLD BRS, 0.390 IN. OD, 0.281 IN. ID 1250-0143 (28480)		EA	2				*	*	*	*	*	C-14	A2A3MP8
X2 H Y557		D	WASHER,FLAT 0.33 OD, 0.205 ID 1250-0006 (28480)		EA	2										A2A3H5
P H Y558	5340-882-0401	D	WASHER,LOCK 88-28 (91737)		EA	2				*	*	*	*	*	C-14	A2A3MP9
P H Y559	6625-998-6525	C	PROBE ASSEMBLY 18.000 IN. O/A LENGTH 00618-646 (28480)		EA	1				*	*	*	*	*	C-9	A2A2
X2 H Y560		D	BODY,CONNECTOR SAME AS Y545 1250-0141 (28480)		EA	REF										A2A2MP4
P H Y561	5365-453-6642	D	BUSHING,MACHINE THREAD SAME AS Y547 1250-0005 (28480)		EA	REF				*	*	*	*	*	C-15	A2A2MP5
P H Y562	5975-931-4820	D	BUSHING,MACHINE THREAD SAME AS Y548 1250-0142 (28480)		EA	REF				*	*	*	*	*	C-15	A2A2MP6
P H Y563	6625-650-4953	D	GASKET SAME AS Y552 88-35 (91737)		EA	REF				*	*	*	*	*	C-15	A2A2MP1
P H Y564	5330-973-8288	D	GASKET SAME AS Y551 1250-0145 (28480)		EA	REF				*	*	*	*	*	C-15	A2A2MP2
P H Y565	5970-933-4602	D	INSULATOR,WASHER SAME AS Y553 1250-0148 (28480)		EA	REF				*	*	*	*	*	C-15	A2A2E1
X2 H Y566		D	NUT,RETIANING SAME AS Y554 1250-0147 (28480)		EA	REF										A2A2H5
X2 H Y567		D	PROBE,BOLOMETER 6.000 IN. X 0.375 IN. DIA O/A 00618-226 (28480)		EA	1										A2A2E2

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X2 H Y568		D	STOP,PROBE AL, 0.812 IN. X 0.625 IN. X 0.250 IN. O/A 620A28C (28480)		EA	1										A2A2MP3
P H Y569	5305-988-7603	*	SCREW,CAP,SOCKET HEAD 8-32 X 0.625 IN. L MS16995-27 (96906)		EA	1				*	*	*	*	*		H1
X2 H Y570		D	TERMINATION,PROBE SAME AS Y555 00618-2056 (28480)		EA	REF										A2A2E3
P H Y571	5935-937-4421	D	WASHER,CLAMP SAME AS Y556 1250-0143 (28480)		EA	REF				*	*	*	*	*	C-15	A2A2MP7
X2 H Y572		D	WASHER,FLAT SAME AS Y557 1250-0006 (28480)		EA	REF										A2A2H6
P H Y573	5310-937-0650	D	WASHER,FLAT SIL PLD BRS, 0.390 IN. OD, 0.031 IN. THK 1250-0146 (28480)		EA	1				*	*	*	*	*	C-15	A2A2MP8
P H Y574	5340-882-0401	D	WASHER,LOCK SAME AS Y558 88-28 (91737)		EA	REF				*	*	*	*	*	C-15	A2A2MP9
A H S Y575		C	RESISTOR ASSEMBLY 6 RESISTORS, 8.750 IN. X 6.687 IN. X 1.250 00618-6071 (28480)		EA	1										A2A5
P H Y576	5305-057-0526	*	SCREW,MACHINE SAME AS Y179 MS51958-30 (96906)		EA	REF				*	*	*	*	*		H2
P H Y577	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H1
P H Y578	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H1
X2 H Y579		D	BRACKET,SUPPORT AL, 8.750 IN. LG X 0.063 IN. THK 00618-0041 (28480)		EA	1										A2A5MP1

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P H Y580	5905-994-8550	D	RESISTOR,FIXED,FILM 464000 OHM, 1 PCT, 1/2W MF7CD4643F (19701)		EA	1				*	*	*	*	*	C-16	A2A5R527
P H Y581	5905-994-8531	D	RESISTOR,FIXED,FILM 1 MEGOHM, 1 PCT, 1/2W MF7CD1004F (19701)		EA	2				*	*	*	*	*	C-16	A2A5R525
P H Y582	5905-931-0286	D	RESISTOR,FIXED,FILM SAME AS Y163 MF7CD1104F (19701)		EA	REF				*	*	*	*	*	C-16	A2A5R521
P H Y583	5905-931-0286	D	RESISTOR,FIXED,FILM SAME AS Y163 MF7CD1104F (19701)		EA	REF				*	*	*	*	*	C-16	A2A5R522
P H Y584	5905-994-8548	D	RESISTOR,FIXED,FILM SAME AS Y160 MF7CD3833F (19701)		EA	REF				*	*	*	*	*	C-16	A2A5R524
P H Y585	5905-057-8483	D	RESISTOR,FIXED,FILM SAME AS Y278 MF7CD8253F (19701)		EA	REF				*	*	*	*	*	C-16	A2A5R520
P H Y586	5940-105-6337	D	TERMINAL BOARD 7 LUGS 332-14-07-183 (71785)		EA	3				*	*	*	*	*	C-16	A2A5TB1
P H Y587	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H2
P H Y588	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H4
P H Y589	5365-937-0638	C	RING,RETAINING 1250-0016 (28480)		EA	1				*	*	*	*	*	C-12	A2MP47
P H Y590	5340-808-7384	C	RING,SEATING BRASS, 0.968 IN. OD, 0.750 IN. ID 618B88A (28480)		EA	1				*	*	*	*	*	C-9	A2MP1
P H Y591	3040-898-1548	C	SHAFT CRES, 1-187 IN. L X 0.250 IN. DIA 5020-0319 (28480)		EA	5				*	*	*	*	*	C-9	A2MP25
P H Y592	3040-898-1548	C	SHAFT SAME AS Y591 5020-0319 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP26

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P H Y593	3040-898-1548	C	SHAFT SAME AS Y591 5020-0319 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP27
P H Y594	3040-898-1548	C	SHAFT SAME AS Y591 5020-0319 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP28
P H Y595	3040-898-1548	C	SHAFT SAME AS Y591 5020-0319 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP29
X2 H Y596		C	SHAFT,COUPLING SST, W/ STL DR PINS, 3.000 IN. L 5020-0318 (28480)		EA	5										A2MP20
X2 H Y597		C	SHAFT,COUPLING SAME AS Y596 5020-0318 (28480)		EA	REF										A2MP21
X2 H Y598		C	SHAFT,COUPLING SAME AS Y596 5020-0318 (28480)		EA	REF										A2MP22
X2 H Y599		C	SHAFT,COUPLING SAME AS Y596 5020-0318 (28480)		EA	REF										A2MP23
X2 H Y600		C	SHAFT,COUPLING SAME AS Y596 5020-0318 (28480)		EA	REF										A2MP24
P H Y601	5960-387-6261	C	SHIELD,ELECTRON TUBE SST, 1.250 IN. L X 1.000 IN. OD 618B3D (28480)		EA	1				*	*	*	*	*	C-9	A2E2
X2 H Y602		C	SHIELD,RESISTOR AL, 3.000 IN. X 1.625 IN. X 0.062 IN. THK 00618-034 (28480)		EA	1										A2MP57
P H Y603	5305-054-6659	*	SCREW,MACHINE CRES. 6-32 X 1-1/4 IN LG MS51957-35 (96906)		EA	2				*	*	*	*	*		H2
P H Y604	5310-184-8977	*	WASHER,LOCK SAME AS Y148 MS35338-98 (96906)		EA	REF				*	*	*	*	*		H2

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P H Y605	6625-998-6524	C	SPACER,SLEEVE AL, 0.218 IN. OD, 0.250 IN. ID, 0.125 IN THK 618847C (28480)		EA	2				*	*	*	*	*	C-12	A2MP2
P H Y606	6625-998-6524	C	SPACER,SLEEVE SAME AS Y605 618847C (28480)		EA	REF				*	*	*	*	*	C-12	A2MP3
P H Y607	5365-150-4945	C	SPACER,SLEEVE BRS, SIL PL, 0.875 IN. L X 0.250 IN. OD 0380-0081 (28480)		EA	2				*	*	*	*	*	C-9	A2MP55
P H Y608	5365-150-4945	C	SPACER,SLEEVE SAME AS Y607 0380-0081 (28480)		EA	REF				*	*	*	*	*	C-9	A2MP56
P H Y609	5360-624-8953	C	SPRING,HELICAL,EXTENSION PH BRZ, 2.500 IN. L X 0.093 IN. DIA 618B3F (28480)		EA	1				*	*	*	*	*	C-9	A2MP14
X2 H Y610		C	STRIP,INSULATOR BAKELITE, 5.625 IN. X 1.625 IN. X 0.093 THK 00618-2046 (28480)		EA	1										A2E5
P H Y611	5310-930-2722	C	WASHER,LOCK SAME AS Y521 5000-0206 (28480)		EA	REF				*	*	*	*	*		A2H5
X2 H Y612		C	WASHER,NONMETALLIC RUBBER, 1.000 IN. OD, 0.843 IN. ID 2190-0496 (28480)		EA	1										A2H1
P H Y613	5355-930-2692	C	WINDOW,DIAL CLEAR LUCITE 5040-0216 (28480)		EA	1				*	*	*	*	*	C-12	A2MP19
P H Y614	5305-054-5636	*	SCREW,MACHINE MS51957-2 (96906)		EA	2				*	*	*	*	*		H2
X2 H Y615		*	WASHER,LOCK MS35333-120 (96906)		EA	2										H2
P H Y616	5355-667-7900	C	WINDOW,DIAL LUCITE, 2.250 IN. X 2.125 IN X 0.062 IN. THK 61B40D1 (28480)		EA	1				*	*	*	*	*	C-12	A2MP17

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X2 H Y617		*	SCREW,MACHINE CAD PL STL, 2-56 X 0.125 IN. L, PHH 18000 (73734)		EA	3										H3
M D Y618		C	WIRING HARNESS,BRANCHED 23.000 IN. O/A 00618-6072 (28480)		EA	1										A2W1
P H Y619	5305-054-5651	*	SCREW,MACHINE CRES, 4-40 X 1/2 IN. LG MS51957-17 (96906)		EA	1				*	*	*	*	*		H1
P H Y620	5305-054-5646	*	SCREW,MACHINE CRES, 4-40 X 3/16 IN. LG MS51957-12 (96906)		EA	2				*	*	*	*	*		H2
P H Y621	5310-939-1063	*	WASHER,LOCK MS35335-85 (96906)		EA	2				*	*	*	*	*		H2
P H Y622	5310-543-2410	*	WASHER,LOCK CAD PL STL, NO. 4 MS35338-40 (96906)		EA	1				*	*	*	*	*		H1
P H Y623		D	CONNECTOR,PLUG,ELECTRICAL 91-6006-5500-00 (95354)		EA	2				*	*	*	*	*	C-17	A2W1J1
A H S Y624		D	RESISTOR BOARD ASSEMBLY 5.000 IN. X 3.500 IN. X 2.875 IN. O/A 00618-643 (28480)		EA	1										A2W1A1
X1 H Y625		E	ELECTRONIC COMPONENTS ASSEMBLY 5.000 IN. X 3.500 IN. X 1.500 IN. O/A 00618-240 (28480)		EA	1										A2W1A1TB1
X2 H Y626		F	BRACKET,ANGLE AL, 2.437 IN. X 0.375 IN. X 0.125 IN. THK 5000-0221 (28480)		EA	4										A2W1A1TB1MP1
X2 Y627		F	BRACKET,ANGLE SAME AS Y626 5000-0221 (28480)		EA	REF										A2W1A1TB1MP2
X2 Y628		F	BRACKET,ANGLE SAME AS Y626 5000-0221 (28480)		EA	REF										A2W1A1TB1MP3

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X2 H Y629		F	BRACKET,ANGLE SAME AS Y626 5000-0221 (28480)		EA	REF										A2W1A1TB1MP4
P H Y630		F	CONNECTOR,PLUG,ELECTRICAL SAME AS Y623 91-6006-5500-00 (95354)		EA	REF				*	*	*	*	*	C-18	A2W1A1TB1P1
X1 H Y631		F	PRINTED WIRING BOARD PHENOLIC, 2.750 IN. X 1.625 IN. X 0.437 IN. 00618-237 (28480)		EA	1										A2W1A1TB1T61
X1 H Y632		F	TERMINAL BOARD BAKELITE, 5.000 IN. X 3.500 IN. X 0.093 THK 00618-236 (28480)		EA	1										A2W1A1TB1PW1
P H Y633	5905-106-1276	E	RESISTOR,FIXED,COMPOSITION 100000 OHM, 5 PCT, 1W RCR32G104JS (81349)		EA	5				*	*	*	*	*	C-18	A2W1A1R169
P H Y634	5905-650-9808	E	RESISTOR,FIXED,COMPOSITION 6800 OHM, 5 PCT, 2W RCR42G682JS (81349)		EA	2				*	*	*	*	*	C-18	A2W1A1R171
P H Y635	5905-650-9808	E	RESISTOR,FIXED,COMPOSITION SAME AS Y634 RCR42G682JS (81349)		EA	REF				*	*	*	*	*	C-18	A2W1A1R172
P H Y636		E	RESISTOR,FIXED,COMPOSITION 4700 OHM, 5 PCT, 2W RCR42G472JS (81349)		EA	2				*	*	*	*	*	C-18	A2W1A1R176
P H Y637		E	RESISTOR,FIXED,COMPOSITION SAME AS Y636 RCR42G472JS (81349)		EA	REF				*	*	*	*	*	C-18	A2W1A1R177
P H Y638	5905-812-6400	E	RESISTOR,VARIABLE 50000 OHM, 10 PCT, 2.25 WATT 2100-0028 (28480)		EA	4				*	*	*	*	*	C-18	A2W1A1R170
P H Y639	5905-812-6400	E	RESISTOR,VARIABLE SAME AS Y638 2100-0028 (28480)		EA	REF				*	*	*	*	*	C-18	A2W1A1R173
P H Y640	5905-812-6400	E	RESISTOR,VARIABLE SAME AS Y638 2100-0028 (28480)		EA	REF				*	*	*	*	*	C-18	A2W1A1R175

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P H Y641	5905-812-6400	E	RESISTOR,VARIABLE SAME AS Y638 2100-0028 (28480)		EA	REF				*	*	*	*	*	C-18	A2W1A1R178
P H Y642	5905-994-8531	D	RESISTOR,FIXED,FILM SAME AS Y581 MF7CD1004F (19701)		EA	REF				*	*	*	*	*	C-17	A2W1R3
P H Y643	5905-829-2827	D	RESISTOR,VARIABLE 1 MEGOHM, 20 PCT, 2W 2100-0047 (28480)		EA	2				*	*	*	*	*	C-17	A2W1R1
P H Y644	5905-172-0855	D	RESISTOR,VARIABLE 1 MEGOHM, 20 PCT, 2.25 WATT 2100-0465 (28480)		EA	1				*	*	*	*	*	C-17	A2W1R2
M D Y645		D	TERMINAL BOARD PHENOLIC, 11 CONTACTS 354-17-11-001 (71785)		EA	1										A2W1TB1
X2 H Y646		B	PANEL,BLANK AL, 9.812 IN. X 5.687 IN. 00618-0050 (28480)		EA	1										MP19
P H Y647	5305-057-0523	*	SCREW,MACHINE SAME AS Y112 MS51958-27 (96906)		EA	REF				*	*	*	*	*		H6
P H Y648	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H6
P H Y649	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H6
X2 H Y650		B	PLATE,BRACKET AL, 2.000 IN. X 2.000 IN. 00618-0038 (28480)		EA	1										MP26
P H Y651	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H1
P H Y652	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H1
A [illegible] S Y653		B	PULSER ASSEMBLY 15.875 IN. X 10.000 IN. X 3.125 IN. O/A 00618-624 (28480)		EA	1										A1

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P H Y654	5305-054-6668	*	SCREW,MACHINE SAME AS Y104 MS51957-43 (96906)		EA	REF				*	*	*	*	*		H4
P H Y655	5310-905-5159	*	WASHER,LOCK SAME AS Y105 MS35335-87 (96906)		EA	REF				*	*	*	*	*		H4
P H Y656	5995-828-9167	C	CABLE ASSEMBLY,RADIO FREQ 618B16T (28480)		EA	1				*	*	*	*	*	C-19	A1W1
P H Y657	5935-882-6993	D	CONTACT,ELECTRIC BRS, 1.000 IN. L, 0.200 IN. OD 1250-0051 (28480)		EA	4				*	*	*	*	*	C-19	A1W1E101
P H Y658	5365-453-6650	D	NUT,CLAMP 1250-0049 (28480)		EA	4				*	*	*	*	*		A1W1MP1
P H Y659	5935-988-7758	D	SHELL,ELECTRICAL CONNECTOR 1.000 IN. L, 0.562 IN. OD 1250-0102 (28480)		EA	4				*	*	*	*	*	C-19	A1W1J101
P H Y660	5995-139-5785	C	CABLE ASSEMBLY,RADIO FREQ 618B16S (28480)		EA	1				*	*	*	*	*	C-19	A1W3
P H Y661	5935-882-6993	D	CONTACT,ELECTRIC SAME AS Y657 1250-0051 (28480)		EA	REF				*	*	*	*	*	C-19	A1W3E103
P H Y662	5365-453-6650	D	NUT,CLAMP SAME AS Y658 1250-0049 (28480)		EA	REF				*	*	*	*	*	C-19	A1W3MP1
P H Y663	5935-988-7758	D	SHELL,ELECTRICAL CONNECTOR SAME AS Y659 1250-0102 (28480)		EA	REF				*	*	*	*	*	C-19	A1W3J103
P H Y664	5995-139-5787	C	CABLE ASSEMBLY,RADIO FREQ 618B16V (28480)		EA	1				*	*	*	*	*	C-19	A1W4
P H Y665	5935-882-6993	D	CONTACT,ELECTRIC SAME AS Y657 1250-0051 (28480)		EA	REF				*	*	*	*	*	C-19	A1W4E104
P H Y666	5365-453-6650	D	NUT,CLAMP SAME AS Y658 1250-0049 (28480)		EA	REF				*	*	*	*	*	C-19	A1W4MP1

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P H Y667	5935-988-7758	D	SHELL,ELECTRICAL CONNECTOR SAME AS Y659 1250-0102 (28480)		EA	REF				*	*	*	*	*	C-19	A1W4J104
P H Y668	5995-139-5786	C	CABLE ASSEMBLY,RADIO FREQ 618B16U (28480)		EA	1				*	*	*	*	*	C-19	A1W2
P H Y669	5935-882-6993	D	CONTACT,ELECTRIC SAME AS Y657 1250-0051 (28480)		EA	REF				*	*	*	*	*	C-19	A1W2E102
P H Y670	5365-453-6650	D	NUT,CLAMP SAME AS Y658 1250-0049 (28480)		EA	REF				*	*	*	*	*	C-19	A1W2MP1
P H Y671	5935-988-7758	D	SHELL,ELECTRICAL CONNECTOR SAME AS Y659 1250-0102 (28480)		EA	REF				*	*	*	*	*	C-19	A1W2J102
P H Y672	5910-666-8475	C	CAPACITOR,FIXED,PAPER 0.25 UF, 10 PCT, 1000 VDCW CP55B1EG254K1 (81349)		EA	3				*	*	*	*	*	C-19	A1C101
P H Y673	5910-666-8475	C	CAPACITOR,FIXED,PAPER SAME AS Y672 CP55B1EG254K1 (81349)		EA	REF				*	*	*	*	*	C-19	A1C123
P H Y674	5910-666-8475	C	CAPACITOR,FIXED,PAPER SAME AS Y672 CP55B1EG254K1 (81349)		EA	REF				*	*	*	*	*	C-19	A1C141
P H Y675	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H2
P H Y676	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H2
P H Y677	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H2
P H Y678	5910-112-7117	C	CAPACITOR,FIXED,PAPER 0.50 UF, 10 PCT, 600 VDCW CP54B1FF504K1 (81349)		EA	1				*	*	*	*	*	C-19	A1C135
P H Y679	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H2

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P H Y680	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86	(96906)		EA	REF				*	*	*	*	*		H2
P H Y681	5910-910-5114	C	CAPACITOR,FIXED,PAPER 0.1 UF, 1000 VDCW 0160-0089	(28480)		EA	1				*	*	*	*	*	C-19	A1C137
P H Y682	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28	(96906)		EA	REF				*	*	*	*	*		H2
P H Y683	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86	(96906)		EA	REF				*	*	*	*	*		H2
P H Y684	5910-913-3595	C	CAPACITOR,FIXED,PAPER 0.1 UF, 10 PCT, 1000 VDCW 90P116	(56289)		EA	1				*	*	*	*	*	C-19	A1C118
P H Y685	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28	(96906)		EA	REF				*	*	*	*	*		H2
P H Y686	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86	(96906)		EA	REF				*	*	*	*	*		H2
P H Y687	5910-797-9731	C	CAPACITOR,FIXED,PAPER SAME AS Y377 0160-0088	(28480)		EA	REF				*	*	*	*	*	C-19	A1C142
P H Y688	5910-893-5179	C	CAPACITOR,FIXED,ELECTROLYTIC 20 UF, 50 VDCW 30D206G050CC2	(56289)		EA	1				*	*	*	*	*	C-19	A1C144
X1 H Y689		C	CHASSIS,ELECTRICAL,EQUIPMENT AL, 15.875 IN. X 7.913 IN. X 2.13 IN. O/A 00618-00071	(28480)		EA	1										A1MP3
P H S Y690	6625-213-2633	C	CIRCUIT CARD ASSEMBLY 00618-6077	(28480)		EA	1				*	*	*	*	*	C-19	A1A900
P H Y691	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28	(96906)		EA	REF				*	*	*	*	*		H4
P H Y692	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86	(96906)		EA	REF				*	*	*	*	*		H4

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P H Y693	5910-883-6281	D	CAPACITOR,FIXED,MICA DI 27 PF, 5 PCT, 300 VDCW 0160-2306 (28480)		EA	3				*	*	*	*	*	C-20	A1A900C122
P H Y694	5910-883-6281	D	CAPACITOR,FIXED,MICA DI SAME AS Y693 0160-2306 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C128
P H Y695	5910-928-5344	D	CAPACITOR,FIXED,MICA DI 270 PF, 5 PCT, 500 VDCW 0140-0206 (28480)		EA	5				*	*	*	*	*	C-20	A1A900C127
P H Y696	5910-928-5344	D	CAPACITOR,FIXED,MICA DI SAME AS Y695 0140-0206 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C129
P H Y697	5910-928-5344	D	CAPACITOR,FIXED,MICA DI SAME AS Y695 0140-0206 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C132
P H Y698	5910-928-5344	D	CAPACITOR,FIXED,MICA DI SAME AS Y695 0140-0206 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C139
P H Y699	5910-463-5949	D	CAPACITOR,FIXED,MICA DI 100 PF, 5 PCT, 300 VDCW 0160-2204 (28480)		EA	4				*	*	*	*	*	C-20	A1A900C138
P H Y700	5910-463-5949	D	CAPACITOR,FIXED,MICA DI SAME AS Y699 0160-2204 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C140
P H Y701	5910-919-0161	D	CAPACITOR,FIXED,MICA DI 4700 PF, 10 PCT, 300 VDCW 0140-0162 (28480)		EA	1				*	*	*	*	*	C-20	A1A900C130
P H Y702	5910-976-3080	D	CAPACITOR,FIXED,MICA DI 0.01 UF, 1 PCT, 300 VDCW 0160-2120 (28480)		EA	8				*	*	*	*	*	C-20	A1A900C115
P H Y703	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900C131
P H Y704	5915-816-7231	D	COIL,RADIO FREQUENCY 350 MH, MAX CURRENT 45 MA 618B60A (28480)		EA	1				*	*	*	*	*	C-20	A1A900L101
X1 H Y705		D	PRINTED WIRING BOARD PHENOLIC, 7.312 IN. X 3.437 IN. X 0.063 THK 00618-2063 (28480)		EA	1										A1A900PW1

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P H Y706	5905-106-9346	D	RESISTOR,FIXED,COMPOSITION 10000 OHM, 5 PCT, 1W RCR32G103JS	(81349)		EA	4				*	*	*	*	*	C-20	A1A900R198
P H Y707	5905-247-8749	D	RESISTOR,FIXED,COMPOSITION 82000 OHM 5 PCT,1W RCR32G823JS	(81349)		EA	1				*	*	*	*	*	C-20	A1A900R208
P H Y708		D	RESISTOR,FIXED,FILM 61900 OHM, 1 PCT, 1/2W MF7CD6192F	(19701)		EA	1				*	*	*	*	*	C-20	A1A900R326
P H Y709	5905-252-1047	D	RESISTOR,FIXED,COMPOSITION 270000 OHM, 5 PCT, 1W RCR32G274JS	(81349)		EA	2				*	*	*	*	*	C-20	A1A900R149
P H Y710	5905-927-2876	D	RESISTOR,FIXED,FILM SAME AS Y201 MF7CD3923F	(19701)		EA	REF				*	*	*	*	*	C-20	A1A900R328
P H Y711	5905-106-9353	D	RESISTOR,FIXED,COMPOSITION 470000 OHM, 5 PCT, 1W RCR32G474JS	(81349)		EA	5				*	*	*	*	*	C-20	A1A900R153
P H Y712	5905-106-9353	D	RESISTOR,FIXED,COMPOSITION SAME AS Y711 RCR32G474JS	(81349)		EA	REF				*	*	*	*	*	C-20	A1A900R154
P H Y713	5905-106-9353	D	RESISTOR,FIXED,COMPOSITION SAME AS Y711 RCR32G474JS	(81349)		EA	REF				*	*	*	*	*	C-20	A1A900R189
P H Y714		D	RESISTOR,FIXED,COMPOSITION 33000 OHM, 5 PCT, 2W RCR42G333JS	(81349)		EA	4				*	*	*	*	*	C-20	A1A900R160
P H Y715		D	RESISTOR,FIXED,COMPOSITION SAME AS Y714 RCR42G333JS	(81349)		EA	REF				*	*	*	*	*	C-20	A1A900R161
P H Y716		D	RESISTOR,FIXED,COMPOSITION SAME AS Y714 RCR42G333JS	(81349)		EA	REF				*	*	*	*	*	C-20	A1A900R196
P H Y717	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION 1200000 OHM, 5 PCT, 1W RCR32G125JS	(81349)		EA	7				*	*	*	*	*	C-20	A1A900R197
P H Y718	5905-930-7959	D	RESISTOR,FIXED,FILM 332000 OHM, 1 PCT, 1/2W MF7CD3323F	(19701)		EA	1				*	*	*	*	*	C-20	A1A900R327

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P H Y719	5905-400-4510	D	RESISTOR,FIXED,FILM 560000 OHM, 5 PCT, 1W RCR32G564JS (81349)		EA	1				*	*	*	*	*	C-20	A1A900R150
P H Y720	5905-184-7703	D	RESISTOR,FIXED,COMPOSITION 10000 OHM, 5 PCT, 2W RCR42G103JS (81349)		EA	5				*	*	*	*	*	C-20	A1A900R145
P H Y721	5905-133-0379	D	RESISTOR,FIXED,COMPOSITION 180000 OHM, 5 PCT, 1W RCR32G184JS (81349)		EA	1				*	*	*	*	*	C-20	A1A900R191
P H Y722	5905-104-8353	D	RESISTOR,FIXED,COMPOSITION 4700 OHM, 5 PCT, 1W RCR32G472JS (81349)		EA	2				*	*	*	*	*	C-20	A1A900R193
P H Y723	5905-247-8684	D	RESISTOR,FIXED,COMPOSITION 1000000 OHM, 5 PCT, 1W RCR32G105JS (81349)		EA	2				*	*	*	*	*	C-20	A1A900R162
P H Y724	5905-244-7911	D	RESISTOR,FIXED,COMPOSITION 6800 OHM, 5 PCT, 1W RCR32G682JS (81349)		EA	1				*	*	*	*	*	C-20	A1A900R195
P H Y725	5905-111-8372	D	RESISTOR,FIXED,COMPOSITION 2200 OHM, 5 PCT, 1W RCR32G222JS (81349)		EA	3				*	*	*	*	*	C-20	A1A900R151
P H Y726	5905-111-8372	D	RESISTOR,FIXED,COMPOSITION SAME AS Y725 RCR32G222JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R152
P H Y727	5905-111-8372	D	RESISTOR,FIXED,COMPOSITION SAME AS Y725 RCR32G222JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R157
P H Y728	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION 47000 OHM, 5 PCT, 1W RCR32G473JS (81349)		EA	8				*	*	*	*	*	C-20	A1A900R155
P H Y729	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R186
P H Y730	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R187
P H Y731	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R192

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P H Y732	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R194
P H Y733	5905-369-6916	D	RESISTOR,FIXED,COMPOSITION 1200 OHM, 5 PCT, 1W RCR32G122JS (81349)		EA	4				*	*	*	*	*	C-20	A1A900R144
P H Y734	5905-247-8733	D	RESISTOR,FIXED,FILM 5600 OHM, 5 PCT, 1W RCR32G562JS (81349)		EA	1				*	*	*	*	*	C-20	A1A900R207
P H Y735	5905-104-8351	D	RESISTOR,FIXED,COMPOSITION 150000 OHM, 5 PCT, 1W RCR32G154JS (81349)		EA	3				*	*	*	*	*	C-20	A1A900R148
P H Y736	5905-104-8351	D	RESISTOR,FIXED,COMPOSITION SAME AS Y735 RCR32G154JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R190
P H Y737	5905-247-8728	D	RESISTOR,FIXED,COMPOSITION 3900 OHM, 5 PCT, 1W RCR32G392JS (81349)		EA	1				*	*	*	*	*	C-20	A1A900R134
P H Y738	5905-106-1276	D	RESISTOR,FIXED,COMPOSITION SAME AS Y633 RCR32G104JS (81349)		EA	REF				*	*	*	*	*	C-20	A1A900R188
P H Y739	5961-904-0296	D	SEMICONDUCTOR DEVICE,DIODE SILICON, 120 VDC, 200 MW, 50 MA 1901-0096 (28480)		EA	1				*	*	*	*	*	C-20	A1A900CR102
P H Y740	5961-950-0537	D	SEMICONDUCTOR DEVICE,DIODE SAME AS Y244 1901-0029 (28480)		EA	REF				*	*	*	*	*	C-20	A1A900CR101
P H S Y741	6625-207-9969	C	CIRCUIT CARD ASSEMBLY 00618-6079 (28480)		EA	1				*	*	*	*	*	C-19	A1A1000
P H Y742	5305-057-0524	*	SCREW,MACHINE SAME AS Y127 MS51958-28 (96906)		EA	REF				*	*	*	*	*		H4
P H Y743	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H4
P H Y744	5910-817-7275	D	CAPACITOR,FIXED,PLASTIC DIEL 0.22 UF, 10 PCT, 200 VDCW 148P22492 (56289)		EA	1				*	*	*	*	*	C-21	A1A1000C143

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P H Y745	5910-920-3776	D	CAPACITOR,FIXED,MICA DI 5 PF, 10 PCT, 500 VDCW 0140-0209 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C113
P H Y746	5910-261-3413	D	CAPACITOR,FIXED,MICA DI 1000 PF, 5 PCT, 300 VDCW 0160-2218 (28480)		EA	3				*	*	*	*	*	C-21	A1A1000C105
P H Y747	5910-261-3413	D	CAPACITOR,FIXED,MICA DI SAME AS Y746 0160-2218 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C107
P H Y748	5910-261-3413	D	CAPACITOR,FIXED,MICA DI SAME AS Y746 0160-2218 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C109
P H Y749	5910-852-3004	D	CAPACITOR,FIXED,MICA DI 39 PF, 5 PCT, 300 VDCW 0140-0190 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C112
P H Y750		D	CAPACITOR,FIXED,MICA DI 2200 PF, 5 PCT, 500 VDCW 0160-3493 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C108
P H Y751	5910-107-2545	D	CAPACITOR,FIXED,MICA DI 180 PF, 5 PCT, 300 VDCW 0140-0197 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C104
P H Y752	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C102
P H Y753	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C106
P H Y754	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C110
P H Y755	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C121
P H Y756	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C124
P H Y757	5910-976-3080	D	CAPACITOR,FIXED,MICA DI SAME AS Y702 0160-2120 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C125

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P H Y758	5910-686-7110	D	CAPACITOR,FIXED,MICA DI 470 PF, 5 PCT, 300 VDCW 0140-0149 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C103
P H Y759	5910-883-6281	D	CAPACITOR,FIXED,MICA DI SAME AS Y693 0160-2306 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C116
P H Y760	5910-928-5344	D	CAPACITOR,FIXED,MICA DI SAME AS Y695 0140-0206 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C119
P H Y761	5910-463-5949	D	CAPACITOR,FIXED,MICA DI SAME AS Y699 0160-2204 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C111
P H Y762	5910-463-5949	D	CAPACITOR,FIXED,MICA DI SAME AS Y699 0160-2204 (28480)		EA	REF				*	*	*	*	*	C-21	A1A1000C117
P H Y763	5910-891-4245	D	CAPACITOR,FIXED,MICA DI 1800 PF, 10 PCT, 300 VDCW 0140-0157 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C126
P H Y764	5910-959-5209	D	CAPACITOR,FIXED,CERAMIC DI 400 PF, 1000 VDCW C016B102E401J (56289)		EA	1				*	*	*	*	*	C-21	A1A1000C120
P H Y765	5910-085-0438	D	CAPACITOR,FIXED,MICA DI 56 PF, 5 PCT, 300 VDCW 0140-0191 (28480)		EA	1				*	*	*	*	*	C-21	A1A1000C114
X1 H Y766		D	PRINTED WIRING BOARD PHENOLIC, 8.063 IN. X 3.437 IN. X 0.063 THK 00618-2064 (28480)		EA	1										A1A1000PW1
P H Y767	5905-247-8722	D	RESISTOR,FIXED,COMPOSITION 270 OHM, 5 PCT, 1W RCR32G271JS (81349)		EA	1				*	*	*	*	*	C-21	A1A1000R137
P H Y768	5905-184-7703	D	RESISTOR,FIXED,COMPOSITION SAME AS Y720 RCR42G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R119
P H Y769	5905-184-7703	D	RESISTOR,FIXED,COMPOSITION SAME AS Y720 RCR42G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R138
P H Y770	5905-184-7703	D	RESISTOR,FIXED,COMPOSITION SAME AS Y720 RCR42G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R139

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P H Y771	5905-184-7703	D	RESISTOR,FIXED,COMPOSITION SAME AS Y720 RCR42G103JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R140
P H Y772	5905-104-8347	D	RESISTOR,FIXED,COMPOSITION 100 OHM, 5 PCT, 1W RCR32G101JS	(81349)		EA	1				*	*	*	*	*	C-21	A1A1000R159
P H Y773	5905-874-0147	D	RESISTOR,FIXED,COMPOSITION 47000 OHM, 5 PCT, 2W RCR42G473JS	(81349)		EA	1				*	*	*	*	*	C-21	A1A1000R103
P H Y774	5905-369-6916	D	RESISTOR,FIXED,COMPOSITION SAME AS Y733 RCR32G122JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R124
P H Y775	5905-369-6916	D	RESISTOR,FIXED,COMPOSITION SAME AS Y733 RCR32G122JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R130
P H Y776	5905-369-6916	D	RESISTOR,FIXED,COMPOSITION SAME AS Y733 RCR32G122JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R199
P H Y777	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R105
P H Y778	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R110
P H Y779	5905-369-6929	D	RESISTOR,FIXED,COMPOSITION SAME AS Y728 RCR32G473JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R123
P H Y780	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R101
P H Y781	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R102
P H Y782	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R104
P H Y783	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS	(81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R128

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P H Y784	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R132
P H Y785	5905-113-4850	D	RESISTOR,FIXED,COMPOSITION SAME AS Y717 RCR32G125JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R143
P H Y786	5905-152-8373	D	RESISTOR,FIXED,COMPOSITION 27000 OHM, 5 PCT, 2W RCR42G273JS (81349)		EA	2				*	*	*	*	*	C-21	A1A1000R107
P H Y787	5905-152-8373	D	RESISTOR,FIXED,COMPOSITION SAME AS Y786 RCR42G273JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R122
P H Y788	5905-106-1276	D	RESISTOR,FIXED,COMPOSITION SAME AS Y633 RCR32G104JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R106
P H Y789	5905-106-1276	D	RESISTOR,FIXED,COMPOSITION SAME AS Y633 RCR32G104JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R109
P H Y790	5905-106-1276	D	RESISTOR,FIXED,COMPOSITION SAME AS Y633 RCR32G104JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R141
P H Y791	5905-235-3534	D	RESISTOR,FIXED,COMPOSITION 680 OHM, 5 PCT, 1W RCR32G681JS (81349)		EA	1				*	*	*	*	*	C-21	A1A1000R116
P H Y792	5905-104-8351	D	RESISTOR,FIXED,COMPOSITION SAME AS Y735 RCR32G154JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R142
P H Y793		D	RESISTOR,FIXED,COMPOSITION SAME AS Y714 RCR42G333JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R135
P H Y794	5905-247-8684	D	RESISTOR,FIXED,COMPOSITION SAME AS Y723 RCR32G105JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R115
P H Y795	5905-252-1047	D	RESISTOR,FIXED,COMPOSITION SAME AS Y709 RCR32G274JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R131
P H Y796	5905-247-8700	D	RESISTOR,FIXED,COMPOSITION 120000 OHM, 5 PCT, 1W RCR32G124JS (81349)		EA	1				*	*	*	*	*	C-21	A1A1000R146

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P H Y797	5905-001-3031	D	RESISTOR,FIXED,COMPOSITION 18000 OHM, 5 PCT, 2W RCR42G183JS (81349)		EA	1				*	*	*	*	*	C-21	A1A1000R118
P H Y798	5905-106-9346	D	RESISTOR,FIXED,COMPOSITION SAME AS Y706 RCR32G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R126
P H Y799	5905-106-9346	D	RESISTOR,FIXED,COMPOSITION SAME AS Y706 RCR32G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R127
P H Y800	5905-106-9346	D	RESISTOR,FIXED,COMPOSITION SAME AS Y706 RCR32G103JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R129
P H Y801	5905-106-9353	D	RESISTOR,FIXED,COMPOSITION SAME AS Y711 RCR32G474JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R108
P H Y802	5905-106-9353	D	RESISTOR,FIXED,COMPOSITION SAME AS Y711 RCR32G474JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R125
P H Y803	5905-104-8353	D	RESISTOR,FIXED,COMPOSITION SAME AS Y722 RCR32G472JS (81349)		EA	REF				*	*	*	*	*	C-21	A1A1000R120
P H Y804	5905-106-1245	D	RESISTOR,FIXED,COMPOSITION 2700 OHM, 5 PCT, 1W RCR32G272JS (81349)		EA	1				*	*	*	*	*	C-21	A1A1000R121
P O Y805	5960-134-9919	C	ELECTRON TUBE 6AL5 (80131)		EA	3	*	*	*	*	*	*	*	*	C-19	A1V102
P O Y806	5960-134-9919	C	ELECTRON TUBE SAME AS Y805 6AL5 (80131)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V106
P O Y807	5960-134-9919	C	ELECTRON TUBE SAME AS Y805 6AL5 (80131)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V108
P O Y808	5960-552-0082	C	ELECTRON TUBE POWER PENTODE, 2.750 IN. X 1.125 IN. 1941-0005 (28480)		EA	1	*	*	*	*	*	*	*	*	C-19	A1V110
P O Y809	5960-615-5584	C	ELECTRON TUBE TWIN TRIODE 12AT7 (80131)		EA	1	*	*	*	*	*	*	*	*	C-19	A1V101

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P O Y810	5960-134-6012	C	ELECTRON TUBE 6189W (81349)		EA	7	*	*	*	*	*	*	*	*	C-19	A1V103
P O Y811	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V104
P O Y812	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V105
P O Y813	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V107
P O Y814	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V109
P O Y815	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V111
P O Y816	5960-134-6012	C	ELECTRON TUBE SAME AS Y810 6189W (81349)		EA	REF	*	*	*	*	*	*	*	*	C-19	A1V115
X1 H Y817		C	INSULATOR,STANDOFF CERAMIC, 0.750 IN. HIGH, 0.375 IN. DIA 3BX4906C (71590)		EA	1										A1E1
P H Y818	5905-106-9344	C	RESISTOR,FIXED,COMPOSITION RCR20G101JS (81349)		EA	1				*	*	*	*	*	C-19	A1R204
P H Y819	5905-856-8688	C	RESISTOR,VARIABLE 20000 OHM, 10 PCT, 1.12W 2100-0051 (28480)		EA	1				*	*	*	*	*	C-19	A1R158
P H Y820	5905-899-8779	C	RESISTOR,VARIABLE 250000 OHM, 10 PCT, 2W 2100-0029 (28480)		EA	2				*	*	*	*	*	C-19	A1R112
P H Y821	5905-899-8779	C	RESISTOR,VARIABLE SAME AS Y820 2100-0029 (28480)		EA	REF				*	*	*	*	*	C-19	A1R113

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P H Y822	5905-919-8613	C	RESISTOR,VARIABLE 3 TANDEM SECT, 1 MEGOHM, 10 PCT EA SECT, 2W 2100-0059 (28480)		EA	1				*	*	*	*	*	C-19	A1R111
P H Y823	5905-023-4837	C	RESISTOR,VARIABLE 1500 OHM, 10 PCT, 2W 2100-0025 (28480)		EA	3				*	*	*	*	*	C-19	A1R117
P H Y824	5905-023-4837	C	RESISTOR,VARIABLE SAME AS Y823 2100-0025 (28480)		EA	REF				*	*	*	*	*	C-19	A1R133
P H Y825	5905-023-4837	C	RESISTOR,VARIABLE SAME AS Y823 2100-0025 (28480)		EA	REF				*	*	*	*	*	C-19	A1R156
P H Y826	5905-829-2827	C	RESISTOR,VARIABLE SAME AS Y643 2100-0047 (28480)		EA	REF				*	*	*	*	*	C-19	A1R136
X1 H Y827		C	RETAINER,CAPACITOR 1210-0007 (28480)		EA	2										A1MP1
X1 H Y828		C	RETAINER,CAPACITOR SAME AS Y827 1210-0007 (28480)		EA	REF										A1MP2
P H Y829	5310-052-1956	*	NUT,SELFLOCKING,HEX 9226 (73734)		EA	4				*	*	*	*	*		H2
P H Y830	5960-054-7561	C	SHIELD,ELECTRON TUBE STEEL, 1.937 IN. L 151-11-23-012 (71785)		EA	8				*	*	*	*	*	C-19	A1E3
P H Y831	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012 (71785)		EA	REF				*	*	*	*	*	C-19	A1E4
P H Y832	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012 (71785)		EA	REF				*	*	*	*	*	C-19	A1E5
P H Y833	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012 (71785)		EA	REF				*	*	*	*	*	C-19	A1E6
P H Y834	5960-054-756.	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012 (71785)		EA	REF				*	*	*	*	*	C-19	A1E7

(1) ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.)	MFR CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT ALW (6) DS 1-20	DS 21-50	DS 51-100	(7) GS 1-20	GS 21-50	GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF / ITEM NUMBER
P H Y835	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012	(71785)		EA	REF				*	*	*	*	*	C-19	A1E8
P H Y836	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012	(71785)		EA	REF				*	*	*	*	*	C-19	A1E9
P H Y837	5960-054-7561	C	SHIELD,ELECTRON TUBE SAME AS Y830 151-11-23-012	(71785)		EA	REF				*	*	*	*	*	C-19	A1E10
P H Y838	5935-829-3501	C	SHIELD,ELECTRON TUBE 113-34-12-026	(71785)		EA	3				*	*	*	*	*	C-19	A1E11
P H Y839	5935-829-3501	C	SHIELD,ELECTRON TUBE SAME AS Y838 113-34-12-026	(71785)		EA	REF				*	*	*	*	*	C-19	A1E12
P H Y840	5935-829-3501	C	SHIELD,ELECTRON TUBE SAME AS Y838 113-34-12-026	(71785)		EA	REF				*	*	*	*	*	C-19	A1E13
P H Y841	5960-537-4737	C	SHIELD,ELECTRON TUBE STEEL, 1.750 IN. L 150-11-23-012	(71785)		EA	1				*	*	*	*	*	C-19	A1E2
P H Y842	5935-943-4072	C	SOCKET,ELECTRON TUBE 121-31-12-104	(71785)		EA	8				*	*	*	*	*	C-19	A1XV101
P H Y843	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104	(71785)		EA	REF				*	*	*	*	*	C-19	A1XV103
P H Y844	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104	(71785)		EA	REF				*	*	*	*	*	C-19	A1XV104
P H Y845	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104	(71785)		EA	REF				*	*	*	*	*	C-19	A1XV105
P H Y846	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104	(71785)		EA	REF				*	*	*	*	*	C-19	A1XV107
P H Y847	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104	(71785)		EA	REF				*	*	*	*	*	C-19	A1XV109

(1) SOURCE CODE / MAINT. CODE / REC. CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY. INCL IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR. ALW. PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT. ALW. PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P H Y848	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104 (71785)		EA	REF				*	*	*	*	*	C-19	A1XV111
P H Y849	5935-943-4072	C	SOCKET,ELECTRON TUBE SAME AS Y842 121-31-12-104 (71785)		EA	REF				*	*	*	*	*	C-19	A1XV115
P H Y850		C	SOCKET,ELECTRON TUBE 111-39-11-018 (71785)		EA	4				*	*	*	*	*	C-19	A1XV102
P H Y851		C	SOCKET,ELECTRON TUBE SAME AS Y850 111-39-11-018 (71785)		EA	REF				*	*	*	*	*	C-19	A1XV106
P H Y852		C	SOCKET,ELECTRON TUBE SAME AS Y850 111-39-11-018 (71785)		EA	REF				*	*	*	*	*	C-19	A1XV108
P H Y853		C	SOCKET,ELECTRON TUBE SAME AS Y850 111-39-11-018 (71785)		EA	REF				*	*	*	*	*	C-19	A1XV110
A H S Y854		C	SWITCH ASSEMBLY,ROTARY 3.000 IN. L X 1.500 IN. DIA 00618-6080 (28480)		EA	1										A1A1
P H Y855	5910-854-7130	D	CAPACITOR,FIXED,CERAMIC DI SAME AS Y156 30GAS10 (56289)		EA	REF				*	*	*	*	*	C-19	A1A1C702
P H Y856		D	RESISTOR,FIXED,FILM 562 OHM, 1 PCT, 1/2W MF7CD5620F (19701)		EA	1				*	*	*	*	*	C-19	A1A1R209
P H Y857	5930-205-9816	D	SWITCH,ROTARY 3 SECT, 7 POSITION, 3.000 IN. X 1.500 IN. 3100-2089 (28480)		EA	1				*	*	*	*	*	C-19	A1A1S102
P H Y858		C	SWITCH,ROTARY 00618-6079 (28480)		EA	1				*	*	*	*	*	C-19	A1S101
P H Y859	5905-982-[illegible]	B	RESISTOR,FIXED,FILM RN55C3482F (81349)		EA	1				*	*	*	*	*	C-3	R376
P H Y860	5905-141-1071	B	RESISTOR,FIXED,COMPOSITION 470000 OHM, 5 PCT, 1/2W RCR20G474JS (81349)		EA	4				*	*	*	*	*	C-3	R421

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO.) MFR CODE	(3c) USE ON CODE	(4) UNIT OF MEAS CODE	(5) QTY INCL IN UNIT	30 DAY MAINT. ALW (6) DS 1-20	DS 21-50	DS 51-100	(7) GS 1-20	GS 21-50	GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
P H Y861	5905-141-1071	B	RESISTOR,FIXED,COMPOSITION SAME AS Y860 RCR20G474JS (81349)		EA	REF				*	*	*	*	*	C-3	R422
P H Y862	5905-141-1071	B	RESISTOR,FIXED,COMPOSITION SAME AS Y860 RCR20G474JS (81349)		EA	REF				*	*	*	*	*	C-3	R423
P H Y863	5905-141-1071	B	RESISTOR,FIXED,COMPOSITION SAME AS Y860 RCR20G474JS (81349)		EA	REF				*	*	*	*	*	C-3	R424
P H Y864		B	RESISTOR,FIXED,FILM 430000 OHM, 5 PCT, 1 WATT C32-4304J (16299)		EA	2				*	*	*	*	*	C-2	R516
P H Y865		B	RESISTOR,FIXED,FILM SAME AS Y864 C32-4304J (16299)		EA	REF				*	*	*	*	*	C-2	R517
P H Y866	5905-950-2798	B	RESISTOR,VARIABLE WIRE WOUND 2 OHM, 10 PCT, 5W, LINEAR 2100-0308 (28480)		EA	1				*	*	*	*	*	C-2	R801
X2 H Y867		B	RING,RETAINING LOCKING RING FOR 7 CONTACT CONNECTOR M7LR (81312)		EA	1										MP29
X2 H Y868		B	SHIELD,MAGNETIC PH BRZ, 3.500 IN. X 3.000 IN. X 1.500 IN O/A 00618-6073 (28480)		EA	1										E1
A H S Y869		B	SOCKET ASSEMBLY 8.250 IN. X 2.187 IN. X 1.750 IN. O/A 00618-6070 (28480)		EA	1										A3
X1 H Y870		C	COVER,HOUSING NP BRS, 1.500 IN. W X 0.500 IN. L 618852B (28480)		EA	1										A3MP2
P H Y871	5305-054-5648	*	SCREW,MACHINE MS51957-14 (96906)		EA	3				*	*	*	*	*		H3
X1 H Y872		C	HOUSING,SOCKET C AL, 3.250 IN. X 2.187 IN. X 1.750 IN. O/A 618852A (28480)		EA	1										A3MP1

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3a) INDENT CODE	(3b) DESCRIPTION REF. NUMBER (MFR. PART NO.) MFR. CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT. ALW. (6) DS 1-20	DS 21-50	DS 51-100	(7) GS 1-20	GS 21-50	GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(b) REF. / ITEM NUMBER
X1 H Y873		C	NUT,UNION AL, 0.562 IN. OD X 0.500 IN. L 5020-0621 (28480)		EA	1										A3H1
P H Y874	5935-257-7154	C	SOCKET,ELECTRON TUBE BAKELITE, 4 PRONG 78S4S (02660)		EA	1				*	*	*	*	*	C-3	A3XV114
P H Y875	6625-998-6517	B	SPRING,LOCK M7LS (81312)		EA	1				*	*	*	*	*	C-2	MP28
M D Y876		B	SUPPORT,BASE AL, 14.062 IN. X 12.625 IN. X 0.093 IN. THK 00618-031 (28480)		EA	1										MP16
M D Y877		B	SUPPORT,BASE 14.000 IN. X 12.625 IN. X 0.093 IN. THK 00618-0053 (28480)		EA	1										MP22
P H Y878	5930-476-9679	B	SWITCH,PUSH 3101-1248 (28480)		EA	1				*	*	*	*	*	C-3	S1
P H Y879	5940-105-6337	B	TERMINAL BOARD SAME AS Y586 332-14-07-183 (71785)		EA	REF				*	*	*	*	*	C-3	TB1
P H Y880	5905-875-4363	B	THERMISTOR 10.0 OHM, PORM 10 PCT 2D754 (03508)		EA	1				*	*	*	*	*	C-3	RT101
X2 H Y881		B	THUMBSCREW AL, 2.500 IN. L X 1.000 IN. DIA, 1/4-20 THD 5020-7433 (28480)		EA	4										H4
P H Y882	5950-056-0131	B	TRANSFORMER,POWER 115/320 V, 10 PCT 9100-1703 (28480)		EA	1				*	*	*	*	*	C-3	T1
X2 H Y883		*	NUT,PLAIN,HEXAGON 82100 (73734)		EA	6										H6
P H Y884	5305-050-9232	*	SCREW,MACHINE MS51957-66 (96906)		EA	4				*	*	*	*	*		H4

(1) SOURCE CODE / MAINT CODE / REC CODE ISN	(2) FEDERAL STOCK NUMBER	(3) IDENT CODE	(3b) DESCRIPTION REF NUMBER (MFR PART NO) / MFR CODE	(3c) USE ON CODE	(4) UNIT OF MEASURE	(5) QTY INCL IN UNIT	30 DAY MAINT ALW (6) DS 1-20	(6) DS 21-50	(6) DS 51-100	(7) GS 1-20	(7) GS 21-50	(7) GS 51-100	(8) 1 YR ALW PER 100 EQUIP CONTGCY PL	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIGURE NUMBER	(10) ILLUSTRATIONS (b) REF. / ITEM NUMBER
X2 H Y885		*	WASHER,LOCK 1308 (73734)		EA	6										H6
X2 H Y886		*	WASHER,LOCK BRS, NP, 0.250 IN. OD, 0.062 IN. THK 2190-0023 (28480)		EA	4										H4
P H Y887	5120-116-7985	B	WRENCH,SOCKET SST, 6.375 IN. L, 1.062 IN. W 618B38 (28480)		EA	1				*	*	*	*	*	C-2	MP1
P H Y888	5310-934-9761	*	NUT,PLAIN,HEXAGON SAME AS Y126 MS35649-264 (96906)		EA	REF				*	*	*	*	*		H2
P H Y889	5305-054-6662	*	SCREW,MACHINE MS51957-38 (96906)		EA	2				*	*	*	*	*		H2
P H Y890	5310-880-5978	*	WASHER,FLAT SAME AS Y119 MS15795-807 (96906)		EA	REF				*	*	*	*	*		H2
P H Y891	5310-939-0903	*	WASHER,LOCK SAME AS Y113 MS35335-86 (96906)		EA	REF				*	*	*	*	*		H2

NOTE: LATEST FEDERAL STOCK NUMBER ASSIGNMENTS ARE INCLUDED AT END OF INDEX

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN	FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
3010-891-4197		A2MP31	Y454	5305-054-6658		H1	Y422
3010-891-4197		A2MP32	Y455	5305-054-6658		H3	Y372
3010-891-4197		A2MP33	Y456	5305-054-6658		H6	Y379
3010-891-4197		A2MP34	Y457	5305-054-6659		H2	Y603
3010-891-4197		A2MP35	Y458	5305-054-6661		H2	Y366
3010-891-4197		A2MP36	Y459	5305-054-6661		H2	Y406
3010-891-4197		A2MP37	Y460	5305-054-6662		H2	Y889
3010-891-4197		A2MP38	Y461	5305-054-6668		H1	Y651
3010-891-4197		A2MP39	Y462	5305-054-6668		H2	Y104
3010-891-4197		A2MP40	Y463	5305-054-6668		H2	Y153
3020-031-1018	C-13	A2A1MP16	Y496	5305-054-6668		H2	Y294
3020-031-1019	C-13	A2A1MP17	Y494	5305-054-6668		H2	Y587
3020-593-5141	C-13	A2A1MP21	Y504	5305-054-6668		H4	Y128
3020-594-0533	C-11	A2A4MP30	Y397	5305-054-6668		H4	Y654
3020-594-0541	C-11	A2A4MP13	Y393	5305-054-6670		H2	Y293
3020-594-0541	C-11	A2A4MP31	Y395	5305-057-0523		H2	Y112
3020-594-0552	C-13	A2A1MP18	Y503	5305-057-0523		H6	Y647
3020-594-0555	C-13	A2A1MP20	Y502	5305-057-0524		H1	Y127
3020-594-0560		A2A1MP22	Y498	5305-057-0524		H1	Y146
3020-600-0794	C-13	A2A1MP13	Y507	5305-057-0524		H1	Y577
3020-600-7080	C-13	A2A1MP15	Y505	5305-057-0524		H2	Y427
3020-600-7082	C-11	A2A4MP32	Y398	5305-057-0524		H2	Y676
3020-600-7084	C-13	A2A1MP12	Y501	5305-057-0524		H2	Y679
3020-660-0792	C-11	A2A4MP33	Y396	5305-057-0524		H2	Y682
3020-831-5994	C-13	A2A1MP19	Y506	5305-057-0524		H2	Y685
3040-127-2837	C-13	A2A1MP26	Y489	5305-057-0524		H4	Y691
3040-127-2837	C-13	A2A1MP27	Y490	5305-057-0524		H4	Y742
3040-127-2837	C-13	A2A1MP28	Y491	5305-057-0526		H1	Y179
3040-127-2837	C-13	A2A1MP29	Y492	5305-057-0526		H1	Y217
3040-127-2837	C-11	A2A4MP39	Y380	5305-057-0526		H1	Y256
3040-127-2837	C-11	A2A4MP40	Y381	5305-057-0526		H2	Y576
3040-898-1548	C-9	A2MP25	Y591	5305-057-0526		H4	Y385
3040-898-1548	C-9	A2MP26	Y592	5305-071-1322		H1	Y362
3040-898-1548	C-9	A2MP27	Y593	5305-860-1749		H1	Y495
3040-898-1548	C-9	A2MP28	Y594	5305-860-1749		H1	Y497
3040-898-1548	C-9	A2MP29	Y595	5305-957-6640		H3	Y478
3110-044-4155	C-13	A2A1MP36	Y481	5305-957-6645		H4	Y541
3110-068-0067	C-13	A2A1MP37	Y482	5305-958-5453		H2	Y414
3110-068-0067	C-13	A2A1MP38	Y483	5305-958-5473		H1	Y528
3110-930-2478	C-13	A2A1MP30	Y479	5305-958-5473		H2	Y468
3110-930-2478	C-13	A2A1MP31	Y480	5305-988-7603		H1	Y569
4130-821-2447	C-2	MP5	Y316	5310-019-0670		H1	Y392
4920-382-9486	C-13	A2A1MP8	Y509	5310-045-3296		H1	Y121
5120-116-7985	C-2	MP1	Y887	5310-045-3296		H2	Y155
5305-050-9232		H4	Y884	5310-045-3296		H2	Y295
5305-054-5636		H2	Y614	5310-052-1956		H2	Y829
5305-054-5646		H2	Y620	5310-125-6170		H8	Y331
5305-054-5648		H3	Y871	5310-184-8977		H1	Y148
5305-054-5651		H1	Y619	5310-184-8977		H1	Y182
5305-054-6652		H1	Y417	5310-184-8977		H1	Y220

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
5310-184-8977		H1	Y259
5310-184-8977		H2	Y424
5310-184-8977		H2	Y429
5310-184-8977		H2	Y604
5310-543-2410		H1	Y622
5310-880-5976		H1	Y180
5310-880-5976		H1	Y218
5310-880-5976		H1	Y257
5310-880-5976		H2	Y367
5310-880-5976		H2	Y423
5310-880-5976		H2	Y428
5310-880-5978		H1	Y119
5310-880-5978		H1	Y147
5310-880-5978		H1	Y391
5310-880-5978		H2	Y154
5310-880-5978		H2	Y368
5310-880-5978		H2	Y407
5310-880-5978		H2	Y890
5310-880-5978		H6	Y648
5310-905-5159		H1	Y418
5310-905-5159		H1	Y529
5310-905-5159		H1	Y652
5310-905-5159		H2	Y105
5310-905-5159		H2	Y469
5310-905-5159		H4	Y129
5310-905-5159		H4	Y588
5310-905-5159		H4	Y655
5310-905-9862		H4	Y386
5310-930-2722		A2A1H4	Y521
5310-930-2722		A2H5	Y611
5310-933-8120		H4	Y120
5310-934-9759		H1	Y115
5310-934-9760		H1	Y313
5310-934-9761		H1	Y126
5310-934-9761		H1	Y178
5310-934-9761		H1	Y216
5310-934-9761		H1	Y255
5310-934-9761		H1	Y421
5310-934-9761		H2	Y365
5310-934-9761		H2	Y675
5310-934-9761		H2	Y888
5310-934-9765		H4	Y116
5310-934-9765		H4	Y125
5310-937-0650	C-15	A2A2MP8	Y573
5310-939-0903		H1	Y181
5310-939-0903		H1	Y219
5310-939-0903		H1	Y258
5310-939-0903		H1	Y578
5310-939-0903		H2	Y113
5310-939-0903		H2	Y486
5310-939-0903		H2	Y677
5310-939-0903		H2	Y680
5310-939-0903		H2	Y683
5310-939-0903		H2	Y686
5310-939-0903		H2	Y891
5310-939-0903		H3	Y373
5310-939-0903		H4	Y692
5310-939-0903		H4	Y743
5310-939-0903		H6	Y649
5310-939-1063		H2	Y621
5310-942-5110		H1	Y315
5330-579-3663		H4	Y369
5330-973-8288	C-15	A2A2MP2	Y564
5330-973-8288	C-14	A2A3MP2	Y551
5340-203-0375	C-9	A2MP42	Y334
5340-203-0375	C-9	A2MP43	Y335
5340-203-0375	C-9	A2MP44	Y336
5340-203-0375	C-9	A2MP45	Y337
5340-203-0375	C-9	A2MP46	Y338
5340-470-0726	C-11	A2A4MP14	Y408
5340-808-7384	C-9	A2MP1	Y590
5340-818-5973	C-12	A2MP41	Y542
5340-882-0401	C-15	A2A2MP9	Y574
5340-882-0401	C-14	A2A3MP9	Y558
5355-401-3243	C-3	A2MP4	Y464
5355-401-3244	C-12	A2MP6	Y471
5355-401-3245	C-12	A2MP10	Y474
5355-543-0066	C-12	A2MP52	Y532
5355-543-0066	C-12	A2MP53	Y533
5355-547-7996	C-12	A2MP50	Y534
5355-547-7996	C-12	A2MP51	Y535
5355-579-2318	C-12	A2MP54	Y536
5355-646-4704	C-12	A2MP48	Y530
5355-646-4704	C-12	A2MP49	Y531
5355-667-7900	C-12	A2MP17	Y616
5355-788-6925	C-12	A2MP16	Y466
5355-816-8372	C-12	A2MP7	Y470
5355-816-8373	C-12	A2MP8	Y473
5355-816-8374	C-12	A2MP9	Y472
5355-883-8579	C-3	MP2	Y291
5355-930-2692	C-12	A2MP19	Y613
5360-594-0409	C-13	A2A1MP32	Y516
5360-594-0409	C-13	A2A1MP33	Y517
5360-594-0409	C-13	A2A1MP34	Y518
5360-594-0409	C-13	A2A1MP35	Y519
5360-594-0409	C-11	A2A4MP43	Y447
5360-594-0409	C-11	A2A4MP44	Y448
5360-594-0409	C-11	A2A4MP45	Y449
5360-594-0409	C-11	A2A4MP46	Y450
5360-624-8953	C-9	A2MP14	Y609

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN	FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
5365-150-4945	C-9	A2MP55	Y607	5905-106-9346	C-20	A1A900R198	Y706
5365-150-4945	C-9	A2MP56	Y608	5905-106-9346	C-21	A1A1000R126	Y798
5365-161-9382	C-10	A2A600MP1	Y355	5905-106-9346	C-21	A1A1000R127	Y799
5365-453-6642	C-15	A2A2MP5	Y561	5905-106-9346	C-21	A1A1000R129	Y800
5365-453-6642	C-14	A2A3MP6	Y547	5905-106-9353	C-20	A1A900R153	Y711
5365-453-6650		A1W1MP1	Y658	5905-106-9353	C-20	A1A900R154	Y712
5365-453-6650	C-19	A1W2MP1	Y670	5905-106-9353	C-20	A1A900R189	Y713
5365-453-6650	C-19	A1W3MP1	Y662	5905-106-9353	C-21	A1A1000R108	Y801
5365-453-6650	C-19	A1W4MP1	Y666	5905-106-9353	C-21	A1A1000R125	Y802
5365-937-0638	C-12	A2MP47	Y589	5905-111-6009	C-7	A300R375	Y229
5820-144-8083	C-6	A500C501	Y175	5905-111-8372	C-20	A1A900R151	Y725
5820-144-8083	C-6	A500C502	Y176	5905-111-8372	C-20	A1A900R152	Y726
5905-001-3031	C-21	A1A1000R118	Y797	5905-111-8372	C-20	A1A900R157	Y727
5905-023-4837	C-19	A1R117	Y823	5905-113-4850	C-20	A1A900R197	Y717
5905-023-4837	C-19	A1R133	Y824	5905-113-4850	C-21	A1A1000R101	Y780
5905-023-4837	C-19	A1R156	Y825	5905-113-4850	C-21	A1A1000R102	Y781
5905-043-0381	C-7	A300R364	Y231	5905-113-4850	C-21	A1A1000R104	Y782
5905-043-0381	C-7	A300R366	Y232	5905-113-4850	C-21	A1A1000R128	Y783
5905-050-7071	C-8	A400R412	Y279	5905-113-4850	C-21	A1A1000R132	Y784
5905-050-7071	C-6	A500R512	Y203	5905-113-4850	C-21	A1A1000R143	Y785
5905-057-5576	C-6	A500R513	Y194	5905-133-0379	C-20	A1A900R191	Y721
5905-057-8480	C-8	A400R415	Y266	5905-141-1071	C-3	R421	Y860
5905-057-8480	C-8	A400R416	Y267	5905-141-1071	C-3	R422	Y861
5905-057-8483	C-16	A2A5R520	Y585	5905-141-1071	C-3	R423	Y862
5905-057-8483	C-8	A400R413	Y278	5905-141-1071	C-3	R424	Y863
5905-057-8495	C-10	A2A600R611	Y346	5905-141-1149	C-7	A300R363	Y234
5905-058-8468	C-8	A400R407	Y269	5905-141-1149	C-7	A300R365	Y235
5905-058-8468	C-6	A500R507	Y190	5905-152-8373	C-21	A1A1000R107	Y786
5905-068-4287	C-10	A2A600R604	Y347	5905-152-8373	C-21	A1A1000R122	Y787
5905-068-4287	C-10	A2A600R605	Y348	5905-156-0435	C-8	A400R401	Y265
5905-069-3922	C-8	A400R405	Y275	5905-172-0854	C-6	A500R528	Y187
5905-069-3922	C-6	A500R505	Y195	5905-172-0855	C-17	A2W1R2	Y644
5905-079-3197	C-7	A300R361	Y224	5905-172-0856	C-5	A700R706	Y165
5905-079-3197	C-7	A300R362	Y225	5905-172-0856	C-5	A700R707	Y166
5905-079-3197	C-7	A300R367	Y226	5905-184-7703	C-20	A1A900R145	Y720
5905-079-3197	C-8	A400R410	Y277	5905-184-7703	C-21	A1A1000R119	Y768
5905-079-3197	C-6	A500R510	Y186	5905-184-7703	C-21	A1A1000R138	Y769
5905-104-8347	C-21	A1A1000R159	Y772	5905-184-7703	C-21	A1A1000R139	Y770
5905-104-8351	C-20	A1A900R148	Y735	5905-184-7703	C-21	A1A1000R140	Y771
5905-104-8351	C-20	A1A900R190	Y736	5905-208-4340	C-5	A700R703	Y164
5905-104-8351	C-21	A1A1000R142	Y792	5905-213-6131	C-5	A700R705	Y161
5905-104-8353	C-20	A1A900R193	Y722	5905-213-6141	C-6	A500R519	Y198
5905-104-8353	C-21	A1A1000R120	Y803	5905-235-3534	C-21	A1A1000R116	Y791
5905-106-1245	C-21	A1A1000R121	Y804	5905-240-4551	C-7	A300R372	Y238
5905-106-1276	C-20	A1A900R188	Y738	5905-244-7911	C-20	A1A900R195	Y724
5905-106-1276	C-21	A1A1000R106	Y788	5905-247-8684	C-20	A1A900R162	Y723
5905-106-1276	C-21	A1A1000R109	Y789	5905-247-8684	C-21	A1A1000R115	Y794
5905-106-1276	C-21	A1A1000R141	Y790	5905-247-8700	C-21	A1A1000R146	Y796
5905-106-1276	C-18	A2W1A1R169	Y633	5905-247-8722	C-21	A1A1000R137	Y767
5905-106-9346	C-19	A1R204	Y818	5905-247-8728	C-20	A1A900R134	Y737

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN	FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
5905-247-8733	C-20	A1A900R207	Y734	5905-931-0286	C-16	A2A5R521	Y582
5905-247-8749	C-20	A1A900R208	Y707	5905-931-0286	C-16	A2A5R522	Y583
5905-252-1047	C-20	A1A900R149	Y709	5905-931-0286	C-5	A700R701	Y163
5905-252-1047	C-21	A1A1000R131	Y795	5905-931-6981	C-10	A2A600R612	Y352
5905-345-7675	C-7	A300R374	Y230	5905-950-2798	C-2	R801	Y866
5905-345-7675	C-6	A500R509	Y188	5905-965-9049	C-10	A2A600R609	Y343
5905-369-6916	C-20	A1A900R144	Y733	5905-965-9051	C-8	A400R417	Y263
5905-369-6916	C-21	A1A1000R124	Y774	5905-965-9051	C-8	A400R418	Y264
5905-369-6916	C-21	A1A1000R130	Y775	5905-982-0469	C-3	R376	Y859
5905-369-6916	C-21	A1A1000R199	Y776	5905-984-7679	C-7	A300R377	Y241
5905-369-6929	C-20	A1A900R155	Y728	5905-984-7679	C-8	A400R414	Y272
5905-369-6929	C-20	A1A900R186	Y729	5905-984-7679	C-6	A500R511	Y202
5905-369-6929	C-20	A1A900R187	Y730	5905-989-9546	C-8	A400R411	Y276
5905-369-6929	C-20	A1A900R192	Y731	5905-994-8531	C-16	A2A5R525	Y581
5905-369-6929	C-20	A1A900R194	Y732	5905-994-8531	C-17	A2W1R3	Y642
5905-369-6929	C-21	A1A1000R105	Y777	5905-994-8537	C-10	A2A600R608	Y345
5905-369-6929	C-21	A1A1000R110	Y778	5905-994-8537	C-7	A300R368	Y237
5905-369-6929	C-21	A1A1000R123	Y779	5905-994-8542	C-10	A2A600R610	Y344
5905-400-4510	C-20	A1A900R150	Y719	5905-994-8542	C-8	A400R404	Y273
5905-422-4129	C-8	A400R408	Y268	5905-994-8542	C-8	A400R419	Y274
5905-456-5251	C-7	A300R373	Y227	5905-994-8544	C-5	A700R702	Y162
5905-456-5251	C-8	A400R406	Y270	5905-994-8545	C-7	A300R369	Y239
5905-456-5251	C-8	A400R409	Y271	5905-994-8545	C-7	A300R370	Y240
5905-456-5251	C-6	A500R506	Y193	5905-994-8548	C-16	A2A5R524	Y584
5905-477-1201	C-6	A500R501	Y189	5905-994-8548	C-5	A700R708	Y160
5905-492-6670	C-7	A300R379	Y228	5905-994-8550	C-16	A2A5R527	Y580
5905-615-3254	C-11	A2A4R174	Y411	5905-994-8553	C-6	A500R502	Y199
5905-650-9808	C-18	A2W1A1R171	Y634	5905-994-8553	C-6	A500R503	Y200
5905-650-9808	C-18	A2W1A1R172	Y635	5910-085-0438	C-21	A1A1000C114	Y765
5905-728-1659	C-10	A2A600R603	Y351	5910-087-3522	C-3	C362	Y134
5905-734-4083	C-10	A2A600R607	Y349	5910-087-3522	C-3	C363	Y135
5905-812-6400	C-18	A2W1A1R170	Y638	5910-087-3522	C-3	C365	Y136
5905-812-6400	C-18	A2W1A1R173	Y639	5910-087-3522	C-3	C503	Y137
5905-812-6400	C-18	A2W1A1R175	Y640	5910-087-3522	C-3	C504	Y138
5905-812-6400	C-18	A2W1A1R178	Y641	5910-087-6816	C-3	C403	Y139
5905-829-2827	C-19	A1R136	Y826	5910-087-6816	C-3	C404	Y140
5905-829-2827	C-17	A2W1R1	Y643	5910-087-6816	C-3	C408	Y141
5905-856-8688	C-19	A1R158	Y819	5910-087-6816	C-3	C409	Y142
5905-874-0147	C-21	A1A1000R103	Y773	5910-107-2545	C-21	A1A1000C104	Y751
5905-875-4363	C-3	RT101	Y880	5910-112-7117	C-19	A1C135	Y678
5905-889-0226	C-10	A2A600R606	Y350	5910-261-3413	C-21	A1A1000C105	Y746
5905-894-3407	C-6	A500R515	Y196	5910-261-3413	C-21	A1A1000C107	Y747
5905-899-8779	C-19	A1R112	Y820	5910-261-3413	C-21	A1A1000C109	Y748
5905-899-8779	C-19	A1R113	Y821	5910-463-5949	C-20	A1A900C138	Y699
5905-919-8613	C-19	A1R111	Y822	5910-463-5949	C-20	A1A900C140	Y700
5905-927-2876	C-20	A1A900R328	Y710	5910-463-5949	C-21	A1A1000C111	Y761
5905-927-2876	C-6	A500R504	Y201	5910-463-5949	C-21	A1A1000C117	Y762
5905-927-8485	C-7	A300R360	Y233	5910-519-6048	C-11	A2A4MP57	Y415
5905-930-7956	C-6	A500R518	Y191	5910-519-6048	C-11	A2A4MP58	Y416
5905-930-7959	C-20	A1A900R327	Y718	5910-666-8475	C-19	A1C101	Y672

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5910-666-8475	C-19	A1C123	Y673
5910-666-8475	C-19	A1C141	Y674
5910-681-9264	C-2	C407	Y131
5910-681-9264	C-2	C508	Y132
5910-681-9264	C-2	C509	Y133
5910-686-7110	C-21	A1A1000C103	Y758
5910-797-4909	C-7	A300C364	Y213
5910-797-4909	C-7	A300C366	Y214
5910-797-4909	C-8	A400C405	Y250
5910-797-4909	C-8	A400C406	Y251
5910-797-4909	C-6	A500C505	Y172
5910-797-4909	C-6	A500C506	Y173
5910-797-4909	C-6	A500C507	Y174
5910-797-9731	C-19	A1C142	Y687
5910-797-9731	C-11	A2A4C136	Y377
5910-817-7275	C-21	A1A1000C143	Y744
5910-851-7794	C-7	A300C360	Y211
5910-851-7794	C-7	A300C361	Y212
5910-851-7794	C-8	A400C401	Y252
5910-851-7794	C-8	A400C402	Y253
5910-852-3004	C-21	A1A1000C112	Y749
5910-854-7130	C-19	A1A1C702	Y855
5910-854-7130	C-5	A700C701	Y156
5910-883-6281	C-20	A1A900C122	Y693
5910-883-6281	C-20	A1A900C128	Y694
5910-883-6281	C-21	A1A1000C116	Y759
5910-891-4245	C-21	A1A1000C126	Y763
5910-893-5179	C-19	A1C144	Y688
5910-910-5114	C-19	A1C137	Y681
5910-913-3595	C-19	A1C118	Y684
5910-919-0161	C-20	A1A900C130	Y701
5910-920-3776	C-21	A1A1000C113	Y745
5910-928-5344	C-20	A1A900C127	Y695
5910-928-5344	C-20	A1A900C129	Y696
5910-928-5344	C-20	A1A900C132	Y697
5910-928-5344	C-20	A1A900C139	Y698
5910-928-5344	C-21	A1A1000C119	Y760
5910-931-1908	C-3	C601	Y143
5910-959-5209	C-21	A1A1000C120	Y764
5910-976-3080	C-20	A1A900C115	Y702
5910-976-3080	C-20	A1A900C131	Y703
5910-976-3080	C-21	A1A1000C102	Y752
5910-976-3080	C-21	A1A1000C106	Y753
5910-976-3080	C-21	A1A1000C110	Y754
5910-976-3080	C-21	A1A1000C121	Y755
5910-976-3080	C-21	A1A1000C124	Y756
5910-976-3080	C-21	A1A1000C125	Y757
5915-421-6425	C-3	FL301	Y317
5915-793-0226	C-11	A2A4FL1	Y389
5915-816-7231	C-20	A1A900L101	Y704
5920-131-9821	C-3	F101	Y319
5920-199-9498	C-7	A300F301	Y221
5920-199-9498	C-8	A400F401	Y260
5920-280-8344	C-6	A500F501	Y183
5920-804-9688	C-7	A300XF301	Y215
5920-804-9688	C-8	A400XF401	Y254
5920-804-9688	C-6	A500XF501	Y177
5920-881-4636	C-3	XF101	Y318
5930-205-9816	C-19	A1A1S102	Y857
5930-476-9679	C-3	S1	Y878
5930-548-7764	C-11	A2A4S103	Y451
5930-755-2005	C-11	A2A4MP56	Y364
5935-111-6192	C-14	A2A3MP3	Y544
5935-113-5091	C-2	MP30	Y290
5935-233-6728	C-3	J1	Y288
5935-257-7154	C-3	A3XV114	Y874
5935-257-9879	C-2	P303	Y287
5935-259-2039	C-2	J303	Y289
5935-478-7535	C-8	A400XV402	Y282
5935-478-7535	C-8	A400XV404	Y283
5935-478-7535	C-6	A500XV502	Y208
5935-478-7535	C-6	A500XV504	Y209
5935-483-3979	C-8	A400XV401	Y284
5935-483-3979	C-8	A400XV403	Y285
5935-483-3979	C-8	A400XV405	Y286
5935-483-3979	C-6	A500XV501	Y206
5935-483-3979	C-6	A500XV503	Y207
5935-808-9569	C-7	A300XV303	Y247
5935-808-9569	C-7	A300XV304	Y248
5935-824-7685	C-14	A2A3J106	Y549
5935-829-3501	C-19	A1E11	Y838
5935-829-3501	C-19	A1E12	Y839
5935-829-3501	C-19	A1E13	Y840
5935-856-6987	C-7	A300XV305	Y246
5935-882-6993	C-19	A1W1E101	Y657
5935-882-6993	C-19	A1W2E102	Y669
5935-882-6993	C-19	A1W3E103	Y661
5935-882-6993	C-19	A1W4E104	Y665
5935-918-4391	C-7	A300XV301	Y242
5935-918-4391	C-7	A300XV302	Y243
5935-920-7094	C-3	A2P1	Y339
5935-931-0420		H1	Y340
5935-937-4421	C-15	A2A2MP7	Y571
5935-937-4421	C-14	A2A3MP8	Y556
5935-943-4072	C-19	A1XV101	Y842
5935-943-4072	C-19	A1XV103	Y843
5935-943-4072	C-19	A1XV104	Y844
5935-943-4072	C-19	A1XV105	Y845
5935-943-4072	C-19	A1XV107	Y846
5935-943-4072	C-19	A1XV109	Y847

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5935-943-4072	C-19	A1XV111	Y848
5935-943-4072	C-19	A1XV115	Y849
5935-945-9824	C-5	A700XV701	Y170
5935-988-7758	C-19	A1W1J101	Y659
5935-988-7758	C-19	A1W2J102	Y671
5935-988-7758	C-19	A1W3J103	Y663
5935-988-7758	C-19	A1W4J104	Y667
5940-105-6337	C-16	A2A5TB1	Y586
5940-105-6337	C-3	TB1	Y879
5950-056-0131	C-3	T1	Y882
5960-054-7561	C-19	A1E3	Y830
5960-054-7561	C-19	A1E4	Y831
5960-054-7561	C-19	A1E5	Y832
5960-054-7561	C-19	A1E6	Y833
5960-054-7561	C-19	A1E7	Y834
5960-054-7561	C-19	A1E8	Y835
5960-054-7561	C-19	A1E9	Y836
5960-054-7561	C-19	A1E10	Y837
5960-088-6527	C-2	V301	Y309
5960-088-6527	C-2	V302	Y310
5960-134-6012	C-19	A1V103	Y810
5960-134-6012	C-19	A1V104	Y811
5960-134-6012	C-19	A1V105	Y812
5960-134-6012	C-19	A1V107	Y813
5960-134-6012	C-19	A1V109	Y814
5960-134-6012	C-19	A1V111	Y815
5960-134-6012	C-19	A1V115	Y816
5960-134-9919	C-19	A1V102	Y805
5960-134-9919	C-19	A1V106	Y806
5960-134-9919	C-19	A1V108	Y807
5960-262-0286	C-2	V402	Y302
5960-262-0286	C-2	V502	Y303
5960-269-3691	C-2	V401	Y304
5960-269-3691	C-2	V405	Y305
5960-269-3691	C-2	V501	Y306
5960-269-3726	C-4	V114	Y299
5960-387-6261	C-9	A2E2	Y601
5960-537-4737	C-19	A1E2	Y841
5960-552-0082	C-19	A1V110	Y808
5960-557-6780	C-2	V404	Y296
5960-557-6780	C-2	V504	Y297
5960-615-5584	C-19	A1V101	Y809
5960-624-4718	C-2	V305	Y298
5960-827-8782	C-2	V303	Y300
5960-827-8782	C-2	V304	Y301
5960-958-0073	C-5	A700V701	Y157
5960-967-1083	C-2	V403	Y307
5960-967-1083	C-2	V503	Y308
5961-060-8638	C-5	A700CR702	Y167
5961-060-8638	C-2	A800CR801	Y150
5961-060-8638	C-2	A800CR802	Y151
5961-836-1887	C-10	A2A600Q601	Y356
5961-836-1887	C-10	A2A600Q602	Y357
5961-858-7372	C-10	A2A600CR601	Y353
5961-902-7499	C-8	A400CR401	Y280
5961-902-7499	C-8	A400CR402	Y281
5961-904-0296	C-20	A1A900CR102	Y739
5961-921-3778	C-6	A500CR501	Y204
5961-921-3778	C-6	A500CR502	Y205
5961-931-0286	C-5	A700CR701	Y168
5961-938-5641	C-5	A700CR703	Y169
5961-950-0537	C-20	A1A900CR101	Y740
5961-950-0537	C-7	A300CR301	Y244
5961-950-0537	C-7	A300CR302	Y245
5961-978-7468	C-10	A2A600CR602	Y354
5961-990-5369	C-10	A2A600Q603	Y358
5970-933-4602	C-15	A2A2E1	Y565
5970-933-4602	C-14	A2A3E1	Y553
5975-931-4820	C-15	A2A2MP6	Y562
5975-931-4820	C-14	A2A3MP7	Y548
5985-833-2427	C-9	A2AT1	Y333
5995-139-5785	C-19	A1W3	Y660
5995-139-5786	C-19	A1W2	Y668
5995-139-5787	C-19	A1W4	Y664
5995-828-9167	C-19	A1W1	Y656
5999-463-9891	C-14	A2A3E2	Y550
6150-351-3405	C-2	W1	Y130
6240-912-5186	C-7	A300DS301	Y222
6240-912-5186	C-8	A400DS401	Y261
6240-912-5186	C-6	A500DS501	Y184
6625-031-1004	C-11	A2A4MP9	Y388
6625-031-1006	C-12	A2MP5	Y476
6625-034-6690	C-13	A2A1MP2	Y520
6625-207-9967	C-4	A700	Y152
6625-207-9969	C-19	A1A1000	Y741
6625-213-2625	C-2	A800	Y145
6625-213-2633	C-19	A1A900	Y690
6625-406-4318	C-9	A2A6	Y467
6625-406-4332	C-12	A2MP12	Y523
6625-406-4332	C-12	A2MP13	Y524
6625-445-6775	C-12	A2MP30	Y527
6625-565-9963		H2	Y525
6625-588-0884	C-11	A2A4MP38	Y390
6625-589-9680	C-13	A2A1MP23	Y500
6625-594-0458	C-13	A2A1MP7	Y493
6625-607-1516	C-11	A2A4MP35	Y443
6625-650-4953	C-15	A2A2MP1	Y563
6625-650-4953	C-14	A2A3MP1	Y552
6625-772-6119	C-12	A2MP18	Y540
6625-877-0280	C-11	A2A4MP34	Y382

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN	FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
6625-877-0281		A2H1	Y537				
6625-883-3256	C-1		Y101				
6625-998-6517	C-2	MP28	Y875				
6625-998-6521	C-9	A2M101	Y332				
6625-998-6522	C-9	A2A3	Y543				
6625-998-6523	C-9	A2E3	Y359				
6625-998-6523	C-9	A2E4	Y360				
6625-998-6524	C-12	A2MP2	Y605				
6625-998-6524	C-12	A2MP3	Y606				
6625-998-6525	C-9	A2A2	Y559				
6625-998-6530	C-9	A2A600	Y341				
7440-019-4686	C-2	B2	Y326				

LATEST FEDERAL STOCK NUMBER ASSIGNMENTS

FEDERAL STOCK NO.	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
6130-490-8923	C-7	A400	Y249

MANUFACTURER PART NUMBER	FED MFR CODE	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
C32-4304J	16299	C-2	R516	Y864
C32-4304J	16299	C-2	R517	Y865
LP1-7-7502K	16299	C-6	A500R514	Y192
MF7CD1214F	19701	C-7	A300R371	Y236
MF7CD5620F	19701	C-19	A1A1R209	Y856
MF7CD6192F	19701	C-20	A1A900R326	Y708
MF8CC8203F	19701	C-6	A500R508	Y197
MS35333-120	96906		H2	Y615
M14L1-4R3	16228	C-2	B1	Y327
M7LR	81312		MP29	Y867
RCR42G333JS	81349	C-20	A1A900R160	Y714
RCR42G333JS	81349	C-20	A1A900R161	Y715
RCR42G333JS	81349	C-20	A1A900R196	Y716
RCR42G333JS	81349	C-21	A1A1000R135	Y793
RCR42G472JS	81349	C-18	A2W1A1R176	Y636
RCR42G472JS	81349	C-18	A2W1A1R177	Y637
00618-00070	28480		MP27	Y122
00618-00071	28480		A1MP3	Y689
00618-0038	28480		MP26	Y650
00618-0041	28480		A2A5MP1	Y579
00618-0049	28480		MP17	Y102
00618-0049	28480		MP18	Y103
00618-0050	28480		MP19	Y646
00618-0052	28480		MP20	Y110
00618-0052	28480		MP21	Y111
00618-0053	28480		MP22	Y877
00618-0054	28480		MP23	Y144
00618-0056	28480		MP24	Y311
00618-0056	28480		MP25	Y312
00618-020	28480		A2MP58	Y538
00618-030	28480		MP15	Y114
00618-031	28480		MP16	Y876
00618-034	28480		A2MP57	Y602
00618-204	28480		A2A4MP55	Y387
00618-2046	28480		A2E5	Y610
00618-2048	28480		MP14	Y292
00618-2051	28480		A700PW1	Y159
00618-2052	28480		A800PW1	Y149
00618-2053	28480		A300PW1	Y223
00618-2054	28480		A400PW1	Y262
00618-2055	28480		A500PW1	Y185
00618-2056	28480		A2A2E3	Y570
00618-2056	28480		A2A3E3	Y555
00618-2057	28480		A700E1	Y158
00618-2058	28480		A2A4H1	Y453
00618-2059	28480		A2A4MP53	Y452
00618-2061	28480		A2A4MP54	Y378
00618-2063	28480		A1A900PW1	Y705
00618-2064	28480		A1A1000PW1	Y766
00618-223	28480		A2A600PW1	Y342

MANUFACTURER PART NUMBER	FED MFR CODE	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
00618-226	28480		A2A2E2	Y567
00618-231	28480		A2A3MP5	Y546
00618-236	28480		A2W1A1TB1PW1	Y632
00618-237	28480		A2W1A1TB1TB1	Y631
00618-238	28480		A2A4MP52	Y370
00618-240	28480		A2W1A1TB1	Y625
00618-242	28480		A2A4MP51	Y383
00618-6056	28480		MP13	Y124
00618-6060	28480	C-2	A300	Y210
00618-6061	28480	C-7	A400	Y249
00618-6062	28480	C-2	A500	Y171
00618-6070	28480		A3	Y869
00618-6071	28480		A2A5	Y575
00618-6072	28480		A2W1	Y618
00618-6073	28480		E1	Y868
00618-6079	28480	C-19	A1S101	Y858
00618-6080	28480		A1A1	Y854
00618-620	28480		A2	Y329
00618-622	28480	C-9	A2A4	Y361
00618-624	28480		A1	Y653
00618-643	28480		A2W1A1	Y624
0160-3493	28480	C-21	A1A1000C108	Y750
0380-0014	28480		A2A4MP49	Y438
0380-0014	28480		A2A4MP50	Y439
0403-0150	28480		MP7	Y320
0403-0150	28480		MP8	Y321
0403-0150	28480		MP9	Y322
0403-0150	28480		MP10	Y323
0403-0150	28480		MP11	Y324
0403-0150	28480		MP12	Y325
111-39-11-018	71785	C-19	A1XV102	Y850
111-39-11-018	71785	C-19	A1XV106	Y851
111-39-11-018	71785	C-19	A1XV108	Y852
111-39-11-018	71785	C-19	A1XV110	Y853
11608	73734		H1	Y107
11608	73734		H1	Y109
11608	73734		H1	Y314
11608	73734		H4	Y118
11608	73734		H8	Y330
.2077	73734		H1	Y117
1210-0007	28480		A1MP1	Y827
1210-0007	28480		A1MP2	Y828
1250-0006	28480		A2A2H6	Y572
1250-0006	28480		A2A3H5	Y557
1250-0141	28480		A2A2MP4	Y560
1250-0141	28480		A2A3MP4	Y545
1250-0147	28480		A2A2H5	Y566
1250-0147	28480		A2A3H4	Y554
1308	73734		H6	Y885
1410-0009	28480		A2A4MP47	Y375

MANUFACTURER PART NUMBER	FED MFR CODE	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
1410-0009	28480		A2A4MP48	Y376
1480-0058	28480		A2A4MP13H1	Y394
1510BUSHING	88245		MP6	Y123
1510NUT	88245		H1	Y328
1678	02732		A2A4MP41	Y444
1678	02732		A2A4MP42	Y445
18000	73734		H3	Y617
2190-0023	28480		H4	Y886
2190-0496	28480		A2H1	Y612
22028	73734		H4	Y465
22042	73734		H2	Y446
22044	73734		H2	Y485
3BX4906C	71590		A1E1	Y817
354-17-11-001	71785		A2W1TB1	Y645
4233	73734		H2	Y526
4233	73734		H3	Y363
5000-0221	28480		A2W1A1TB1MP1	Y626
5000-0221	28480		A2W1A1TB1MP2	Y627
5000-0221	28480		A2W1A1TB1MP3	Y628
5000-0221	28480		A2W1A1TB1MP4	Y629
5020-0256	28480		A2A1MP24	Y512
5020-0256	28480		A2A1MP25	Y513
5020-0318	28480		A2MP20	Y596
5020-0318	28480		A2MP21	Y597
5020-0318	28480		A2MP22	Y598
5020-0318	28480		A2MP23	Y599
5020-0318	28480		A2MP24	Y600
5020-0340	28480		A2A4MP36	Y431
5020-0349	28480		A2A4MP37	Y430
5020-0621	28480		A3H1	Y873
5020-7433	28480		H4	Y881
618B12D	28480		MP3	Y106
618B12E	28480		MP4	Y108
618B3A	28480		A2MP15	Y522
618B35	28480	C-9	A2A1	Y477
618B35A	28480		A2A1MP4	Y508
618B35B	28480		A2A1MP5	Y510
618B35D	28480		A2A1MP6	Y515
618B35H	28480		A2A1MP9	Y487
618B35I	28480		A2A1MP10	Y511
618B35J	28480		A2A1MP11	Y514
618B35M	28480		A2A1MP14	Y499
618B36AA	28480		A2A4MP3	Y402
618B36AD	28480		A2A4X1	Y371
618B36AE	28480		A2A4MP4	Y440
618B36AE	28480		A2A4MP5	Y441
618B36AE	28480		A2A4MP6	Y442
618B36AJ	28480		A2A4MP7	Y409
618B36AJ	28480		A2A4MP8	Y410
618B36AT	28480		A2A4MP10	Y403

MANUFACTURER PART NUMBER	FED MFR CODE	FIGURE NUMBER	REFERENCE DESIGNATOR	ISN
618B36AT	28480		A2A4MP11	Y404
618B36AT	28480		A2A4MP12	Y405
618B36D	28480		A2A4MP15	Y399
618B36D	28480		A2A4MP16	Y400
618B36E	28480		A2A4MP17	Y425
618B36E	28480		A2A4MP18	Y426
618B36E	28480		A2A4MP19	Y419
618B36E	28480		A2A4MP20	Y420
618B36F	28480		A2A4MP21	Y432
618B36F	28480		A2A4MP22	Y433
618B36F	28480		A2A4MP23	Y434
618B36F	28480		A2A4MP24	Y435
618B36F	28480		A2A4MP25	Y436
618B36F	28480		A2A4MP26	Y437
618B36G	28480		A2A4MP27	Y374
618B36L	28480		A2A4MP28	Y412
618B36L	28480		A2A4MP29	Y413
618B40Q	28480		A2MP11	Y475
618B47A	28480		A2A1MP3	Y484
618B52A	28480		A3MP1	Y872
618B52B	28480		A3MP2	Y870
620A28C	28480		A2A2MP3	Y568
620A36AA	28480		A2A4MP2	Y401
620A36BB	28480		A2A4MP1	Y384
624B59C5	28480		A2A1MP1	Y488
7120-1269	28480		A2E1	Y539
82100	73734		H6	Y883
91-6006-5500-00	95354	C-18	A2W1A1TB1P1	Y630
91-6006-5500-00	95354	C-17	A2W1J1	Y623

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.	REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A1	Y653	A1A900R208	Y707
A1A1	Y854	A1A900R326	Y708
A1A1C702	Y855	A1A900R327	Y718
A1A1R209	Y856	A1A900R328	Y710
A1A1S102	Y857	A1A1000	Y741
A1A900	Y690	A1A1000C102	Y752
A1A900C115	Y702	A1A1000C103	Y758
A1A900C122	Y693	A1A1000C104	Y751
A1A900C127	Y695	A1A1000C105	Y746
A1A900C128	Y694	A1A1000C106	Y753
A1A900C129	Y696	A1A1000C107	Y747
A1A900C130	Y701	A1A1000C108	Y750
A1A900C131	Y703	A1A1000C109	Y748
A1A900C132	Y697	A1A1000C110	Y754
A1A900C138	Y699	A1A1000C111	Y761
A1A900C139	Y698	A1A1000C112	Y749
A1A900C140	Y700	A1A1000C113	Y745
A1A900CR101	Y740	A1A1000C114	Y765
A1A900CR102	Y739	A1A1000C116	Y759
A1A900L101	Y704	A1A1000C117	Y762
A1A900PW1	Y705	A1A1000C119	Y760
A1A900R134	Y737	A1A1000C120	Y764
A1A900R144	Y733	A1A1000C121	Y755
A1A900R145	Y720	A1A1000C124	Y756
A1A900R148	Y735	A1A1000C125	Y757
A1A900R149	Y709	A1A1000C126	Y763
A1A900R150	Y719	A1A1000C143	Y744
A1A900R151	Y725	A1A1000PW1	Y766
A1A900R152	Y726	A1A1000R101	Y780
A1A900R153	Y711	A1A1000R102	Y781
A1A900R154	Y712	A1A1000R103	Y773
A1A900R155	Y728	A1A1000R104	Y782
A1A900R157	Y727	A1A1000R105	Y777
A1A900R160	Y714	A1A1000R106	Y788
A1A900R161	Y715	A1A1000R107	Y786
A1A900R162	Y723	A1A1000R108	Y801
A1A900R186	Y729	A1A1000R109	Y789
A1A900R187	Y730	A1A1000R110	Y778
A1A900R188	Y738	A1A1000R115	Y794
A1A900R189	Y713	A1A1000R116	Y791
A1A900R190	Y736	A1A1000R118	Y797
A1A900R191	Y721	A1A1000R119	Y768
A1A900R192	Y731	A1A1000R120	Y803
A1A900R193	Y722	A1A1000R121	Y804
A1A900R194	Y732	A1A1000R122	Y787
A1A900R195	Y724	A1A1000R123	Y779
A1A900R196	Y716	A1A1000R124	Y774
A1A900R197	Y717	A1A1000R125	Y802
A1A900R198	Y706	A1A1000R126	Y798
A1A900R207	Y734	A1A1000R127	Y799

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.	REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A1A1000R128	Y783	A1V101	Y809
A1A1000R129	Y800	A1V102	Y805
A1A1000R130	Y775	A1V103	Y810
A1A1000R131	Y795	A1V104	Y811
A1A1000R132	Y784	A1V105	Y812
A1A1000R135	Y793	A1V106	Y806
A1A1000R137	Y767	A1V107	Y813
A1A1000R138	Y769	A1V108	Y807
A1A1000R139	Y770	A1V109	Y814
A1A1000R140	Y771	A1V110	Y808
A1A1000R141	Y790	A1V111	Y815
A1A1000R142	Y792	A1V115	Y816
A1A1000R143	Y785	A1W1	Y656
A1A1000R146	Y796	A1W1E101	Y657
A1A1000R159	Y772	A1W1J101	Y659
A1A1000R199	Y776	A1W1MP1	Y658
A1C101	Y672	A1W2	Y668
A1C118	Y68'	A1W2E102	Y669
A1C123	Y673	A1W2J102	Y671
A1C135	Y678	A1W2MP1	Y670
A1C137	Y681	A1W3	Y660
A1C141	Y674	A1W3E103	Y661
A1C142	Y687	A1W3J103	Y663
A1C144	Y688	A1W3MP1	Y662
A1E1	Y817	A1W4	Y664
A1E2	Y841	A1W4E104	Y665
A1E3	Y830	A1W4J104	Y667
A1E4	Y831	A1W4MP1	Y666
A1E5	Y832	A1XV101	Y842
A1E6	Y833	A1XV102	Y850
A1E7	Y834	A1XV103	Y843
A1E8	Y835	A1XV104	Y844
A1E9	Y836	A1XV105	Y845
A1E10	Y837	A1XV106	Y851
A1E11	Y838	A1XV107	Y846
A1E12	Y839	A1XV108	Y852
A1E13	Y840	A1XV109	Y847
A1MP1	Y827	A1XV110	Y853
A1MP2	Y828	A1XV111	Y848
A1MP3	Y689	A1XV115	Y849
A1R111	Y822	A2	Y329
A1R112	Y820	A2A1	Y477
A1R113	Y921	A2A1H4	Y521
A1R117	Y823	A2A1MP1	Y488
A1R133	Y824	A2A1MP2	Y520
A1R136	Y826	A2A1MP3	Y484
A1R156	Y825	A2A1MP4	Y508
A1R158	Y819	A2A1MP5	Y510
A1R204	Y818	A2A1MP6	Y515
A1S101	Y858	A2A1MP7	Y493

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A2A1MP8	Y509
A2A1MP9	Y487
A2A1MP10	Y511
A2A1MP11	Y514
A2A1MP12	Y501
A2A1MP13	Y507
A2A1MP14	Y499
A2A1MP15	Y505
A2A1MP16	Y496
A2A1MP17	Y494
A2A1MP18	Y503
A2A1MP19	Y506
A2A1MP20	Y502
A2A1MP21	Y504
A2A1MP22	Y498
A2A1MP23	Y500
A2A1MP24	Y512
A2A1MP25	Y513
A2A1MP26	Y489
A2A1MP27	Y490
A2A1MP28	Y491
A2A1MP29	Y492
A2A1MP30	Y479
A2A1MP31	Y480
A2A1MP32	Y516
A2A1MP33	Y517
A2A1MP34	Y518
A2A1MP35	Y519
A2A1MP36	Y481
A2A1MP37	Y482
A2A1MP38	Y483
A2A2	Y559
A2A2E1	Y565
A2A2E2	Y567
A2A2E3	Y570
A2A2H5	Y566
A2A2H6	Y572
A2A2MP1	Y563
A2A2MP2	Y564
A2A2MP3	Y568
A2A2MP4	Y560
A2A2MP5	Y561
A2A2MP6	Y562
A2A2MP7	Y571
A2A2MP8	Y573
A2A2MP9	Y574
A2A3	Y543
A2A3E1	Y553
A2A3E2	Y550
A2A3E3	Y555
A2A3H4	Y554
A2A3H5	Y557
A2A3J106	Y549
A2A3MP1	Y552
A2A3MP2	Y551
A2A3MP3	Y544
A2A3MP4	Y545
A2A3MP5	Y546
A2A3MP6	Y547
A2A3MP7	Y548
A2A3MP8	Y556
A2A3MP9	Y558
A2A4	Y361
A2A4C136	Y377
A2A4FL1	Y389
A2A4H1	Y453
A2A4MP1	Y384
A2A4MP2	Y401
A2A4MP3	Y402
A2A4MP4	Y440
A2A4MP5	Y441
A2A4MP6	Y442
A2A4MP7	Y409
A2A4MP8	Y410
A2A4MP9	Y388
A2A4MP10	Y403
A2A4MP11	Y404
A2A4MP12	Y405
A2A4MP13	Y393
A2A4MP13H1	Y394
A2A4MP14	Y408
A2A4MP15	Y399
A2A4MP16	Y400
A2A4MP17	Y425
A2A4MP18	Y426
A2A4MP19	Y419
A2A4MP20	Y420
A2A4MP21	Y432
A2A4MP22	Y433
A2A4MP23	Y434
A2A4MP24	Y435
A2A4MP25	Y436
A2A4MP26	Y437
A2A4MP27	Y374
A2A4MP28	Y412
A2A4MP29	Y413
A2A4MP30	Y397
A2A4MP31	Y395
A2A4MP32	Y398
A2A4MP33	Y396

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.	REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A2A4MP34	Y382	A2A600R607	Y349
A2A4MP35	Y443	A2A600R608	Y345
A2A4MP36	Y431	A2A600R609	Y343
A2A4MP37	Y430	A2A600R610	Y344
A2A4MP38	Y390	A2A600R611	Y346
A2A4MP39	Y380	A2A600R612	Y352
A2A4MP40	Y381	A2AT1	Y333
A2A4MP41	Y444	A2E1	Y539
A2A4MP42	Y445	A2E2	Y601
A2A4MP43	Y447	A2E3	Y359
A2A4MP44	Y448	A2E4	Y360
A2A4MP45	Y449	A2E5	Y610
A2A4MP46	Y450	A2H1	Y537
A2A4MP47	Y375	A2H1	Y612
A2A4MP48	Y376	A2H5	Y611
A2A4MP49	Y438	A2M101	Y332
A2A4MP50	Y439	A2MP1	Y590
A2A4MP51	Y383	A2MP2	Y605
A2A4MP52	Y370	A2MP3	Y606
A2A4MP53	Y452	A2MP4	Y464
A2A4MP54	Y378	A2MP5	Y476
A2A4MP55	Y387	A2MP6	Y471
A2A4MP56	Y364	A2MP7	Y470
A2A4MP57	Y415	A2MP8	Y473
A2A4MP58	Y416	A2MP9	Y472
A2A4R174	Y411	A2MP10	Y474
A2A4S103	Y451	A2MP11	Y475
A2A4X1	Y371	A2MP12	Y523
A2A5	Y575	A2MP13	Y524
A2A5MP1	Y579	A2MP14	Y609
A2A5R520	Y585	A2MP15	Y522
A2A5R521	Y582	A2MP16	Y466
A2A5R522	Y583	A2MP17	Y616
A2A5R524	Y584	A2MP18	Y540
A2A5R525	Y581	A2MP19	Y613
A2A5R527	Y580	A2MP20	Y596
A2A5TB1	Y586	A2MP21	Y597
A2A6	Y467	A2MP22	Y598
A2A600	Y341	A2MP23	Y599
A2A600CR601	Y353	A2MP24	Y600
A2A600CR602	Y354	A2MP25	Y591
A2A600MP1	Y355	A2MP26	Y592
A2A600PW1	Y342	A2MP27	Y593
A2A600Q601	Y356	A2MP28	Y594
A2A600Q602	Y357	A2MP29	Y595
A2A600Q603	Y358	A2MP30	Y527
A2A600R603	Y351	A2MP31	Y454
A2A600R604	Y347	A2MP32	Y455
A2A600R605	Y348	A2MP33	Y456
A2A600R606	Y350	A2MP34	Y457

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.	REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A2MP35	Y458	A3H1	Y873
A2MP36	Y459	A3MP1	Y872
A2MP37	Y460	A3MP2	Y870
A2MP38	Y461	A3XV114	Y874
A2MP39	Y462	A300	Y210
A2MP40	Y463	A300C360	Y211
A2MP41	Y542	A300C361	Y212
A2MP42	Y334	A300C364	Y213
A2MP43	Y335	A300C366	Y214
A2MP44	Y336	A300CR301	Y244
A2MP45	Y337	A300CR302	Y245
A2MP46	Y338	A300DS301	Y222
A2MP47	Y589	A300F301	Y221
A2MP48	Y530	A300PW1	Y223
A2MP49	Y531	A300R360	Y233
A2MP50	Y534	A300R361	Y224
A2MP51	Y535	A300R362	Y225
A2MP52	Y532	A300R363	Y234
A2MP53	Y533	A300R364	Y231
A2MP54	Y536	A300R365	Y235
A2MP55	Y607	A300R366	Y232
A2MP56	Y608	A300R367	Y226
A2MP57	Y602	A300R368	Y237
A2MP58	Y538	A300R369	Y239
A2P1	Y339	A300R370	Y240
A2W1	Y618	A300R371	Y236
A2W1A1	Y624	A300R372	Y238
A2W1A1R169	Y633	A300R373	Y227
A2W1A1R170	Y638	A300R374	Y230
A2W1A1R171	Y634	A300R375	Y229
A2W1A1R172	Y635	A300R377	Y241
A2W1A1R173	Y639	A300R379	Y228
A2W1A1R175	Y640	A300XF301	Y215
A2W1A1R176	Y636	A300XV301	Y242
A2W1A1R177	Y637	A300XV302	Y243
A2W1A1R178	Y641	A300XV303	Y247
A2W1A1TB1	Y625	A300XV304	Y248
A2W1A1TB1MP1	Y626	A300XV305	Y246
A2W1A1TB1MP2	Y627	A400	Y249
A2W1A1TB1MP3	Y628	A400C401	Y252
A2W1A1TB1MP4	Y629	A400C402	Y253
A2W1A1TB1P1	Y630	A400C405	Y250
A2W1A1TB1PW1	Y632	A400C406	Y251
A2W1A1TB1TB1	Y631	A400CR401	Y280
A2W1J1	Y623	A400CR402	Y281
A2W1R1	Y643	A400DS401	Y261
A2W1R2	Y644	A400F401	Y260
A2W1R3	Y642	A400PW1	Y262
A2W1TB1	Y645	A400R401	Y265
A3	Y869	A400R404	Y273

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.	REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
A400R405	Y275	A500XF501	Y177
A400R406	Y270	A500XV501	Y206
A400R407	Y269	A500XV502	Y208
A400R408	Y268	A500XV503	Y207
A400R409	Y271	A500XV504	Y209
A400R410	Y277	A700	Y152
A400R411	Y276	A700C701	Y156
A400R412	Y279	A700CR701	Y168
A400R413	Y278	A700CR702	Y167
A400R414	Y272	A700CR703	Y169
A400R415	Y266	A700E1	Y158
A400R416	Y267	A700PW1	Y159
A400R417	Y263	A700R701	Y163
A400R418	Y264	A700R702	Y162
A400R419	Y274	A700R703	Y164
A400XF401	Y254	A700R705	Y161
A400XV401	Y284	A700R706	Y165
A400XV402	Y282	A700R707	Y166
A400XV403	Y285	A700R708	Y160
A400XV404	Y283	A700V701	Y157
A400XV405	Y286	A700XV701	Y170
A500	Y171	A800	Y145
A500C501	Y175	A800CR801	Y150
A500C502	Y176	A800CR802	Y151
A500C505	Y172	A800PW1	Y149
A500C506	Y173	B1	Y327
A500C507	Y174	B2	Y326
A500CR501	Y204	C362	Y134
A500CR502	Y205	C363	Y135
A500DS501	Y184	C365	Y136
A500F501	Y183	C403	Y139
A500PW1	Y185	C404	Y140
A500R501	Y189	C407	Y131
A500R502	Y199	C408	Y141
A500R503	Y200	C409	Y142
A500R504	Y201	C503	Y137
A500R505	Y195	C504	Y138
A500R506	Y193	C508	Y132
A500R507	Y190	C509	Y133
A500R508	Y197	C601	Y143
A500R509	Y188	E1	Y868
A500R510	Y186	F101	Y319
A500R511	Y202	FL301	Y317
A500R512	Y203	J1	Y288
A500R513	Y194	J303	Y289
A500R514	Y192	MP1	Y887
A500R515	Y196	MP2	Y291
A500R518	Y191	MP3	Y106
A500R519	Y198	MP4	Y108
A500R528	Y187	MP5	Y316

REFERENCE DESIGNATOR	ITEM SEQUENCE NO.
MP6	Y123
MP7	Y320
MP8	Y321
MP9	Y322
MP10	Y323
MP11	Y324
MP12	Y325
MP13	Y124
MP14	Y292
MP15	Y114
MP16	Y876
MP17	Y102
MP18	Y103
MP19	Y646
MP20	Y110
MP21	Y111
MP22	Y877
MP23	Y144
MP24	Y311
MP25	Y312
MP26	Y650
MP27	Y122
MP28	Y875
MP29	Y867
MP30	Y290
P303	Y287
R376	Y859
R421	Y860
R422	Y861
R423	Y862
R424	Y863
R516	Y864
R517	Y865
R801	Y866
RT101	Y880
S1	Y878
T1	Y882
TB1	Y879
V114	Y299
V301	Y309
V302	Y310
V303	Y300
V304	Y301
V305	Y298
V401	Y304
V402	Y302
V403	Y307
V404	Y296
V405	Y305
V501	Y306
V502	Y303
V503	Y308
V504	Y297
W1	Y130
XF101	Y318

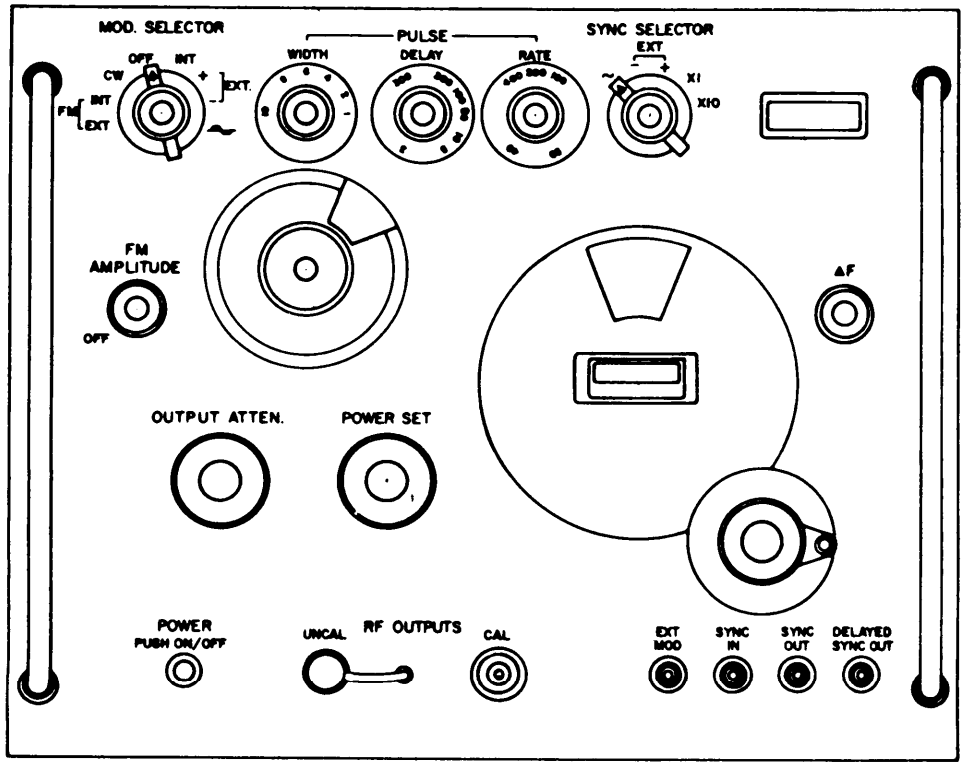


Figure C-1. Signal generator AN/URM-170

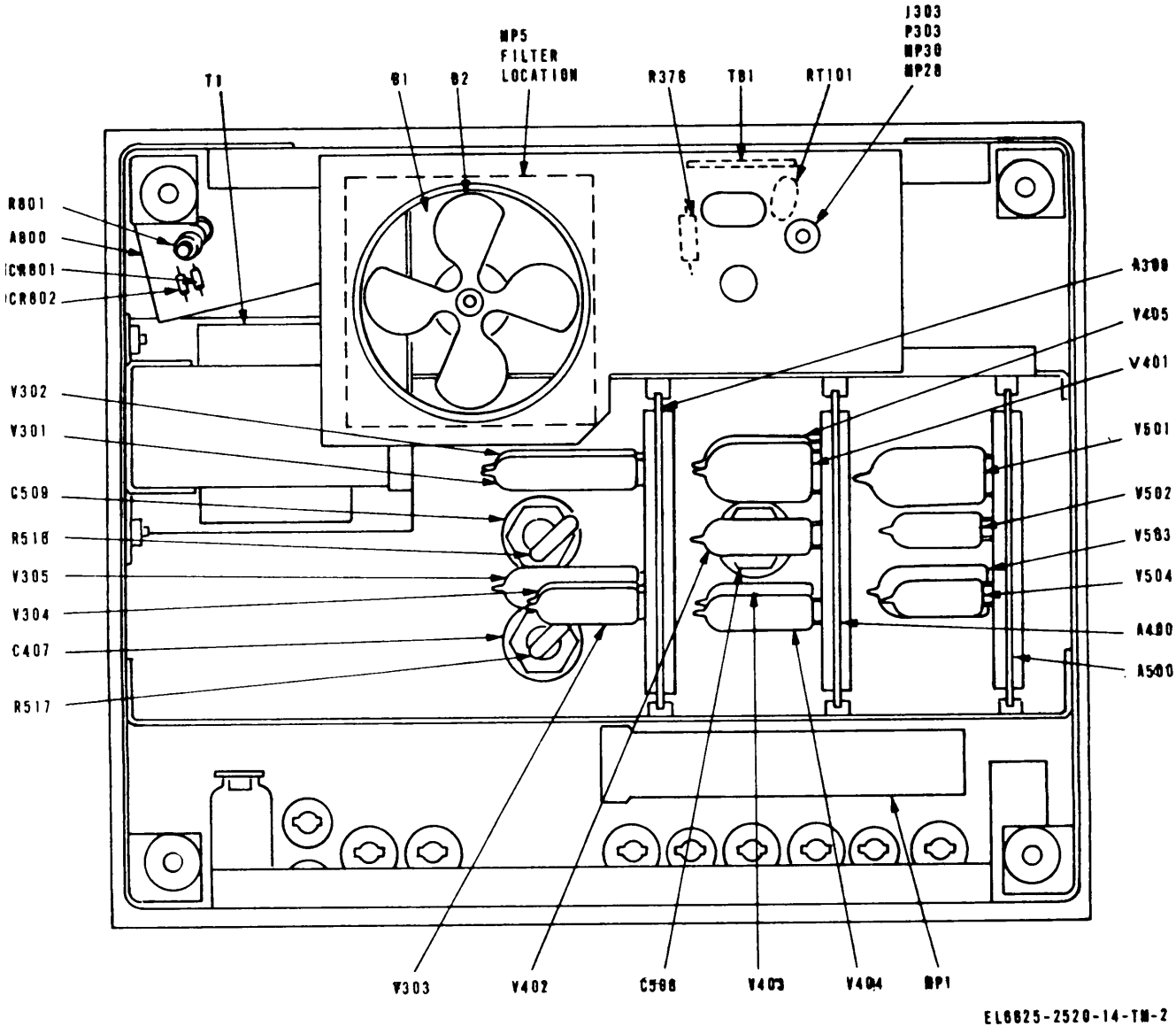


Figure C-2. Signal generator, rear view, cover removed.

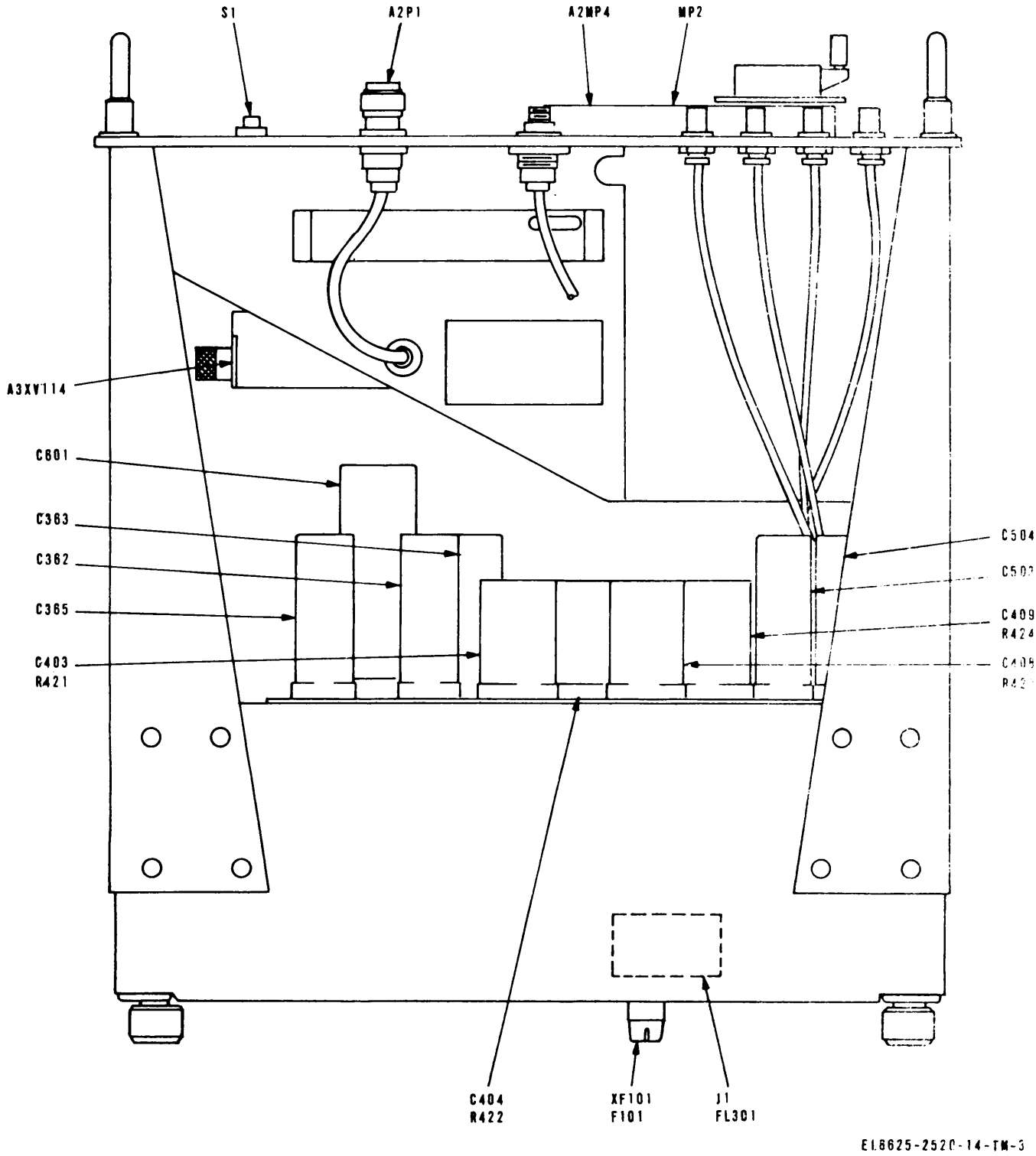


Figure C-3. Signal generator, bottom view, cover removed.

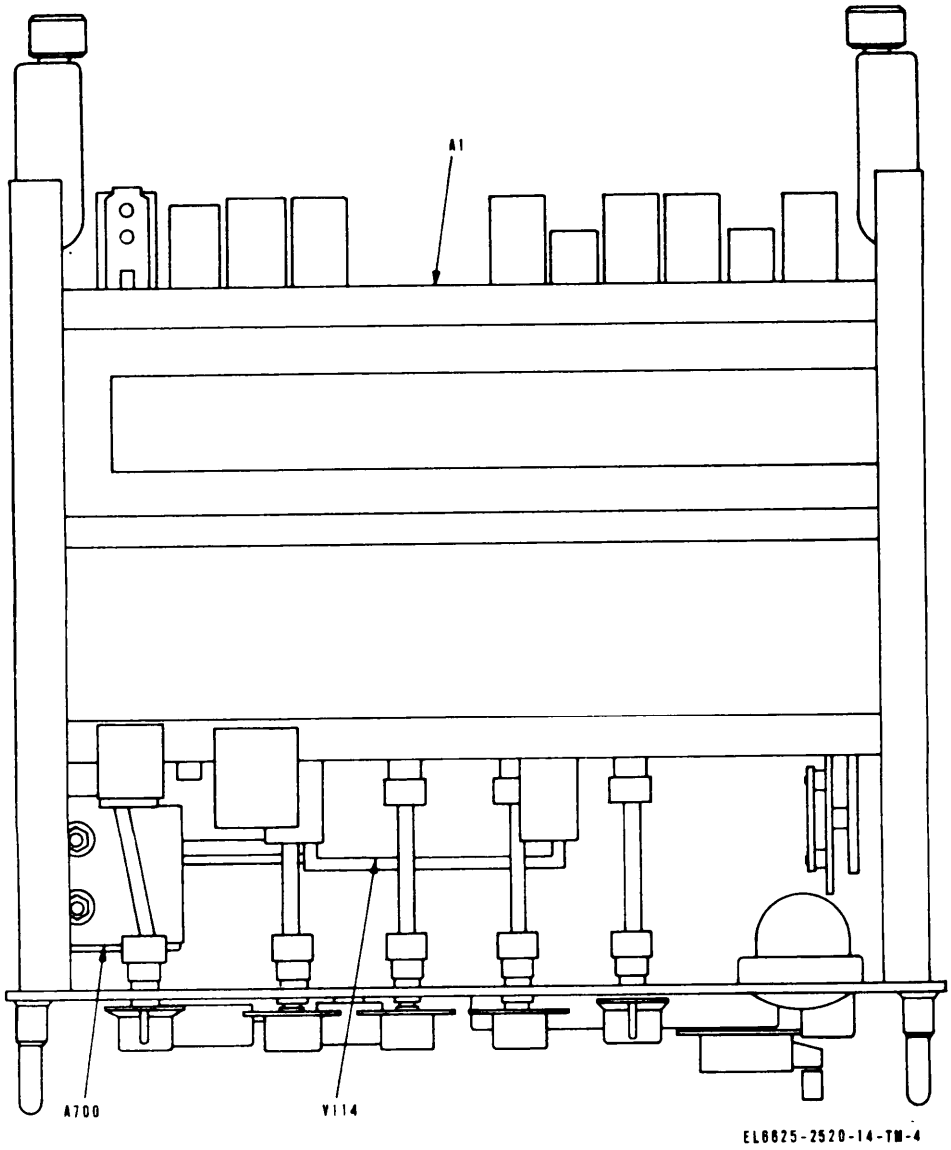


Figure C-4. Signal generator, top view, cover removed.

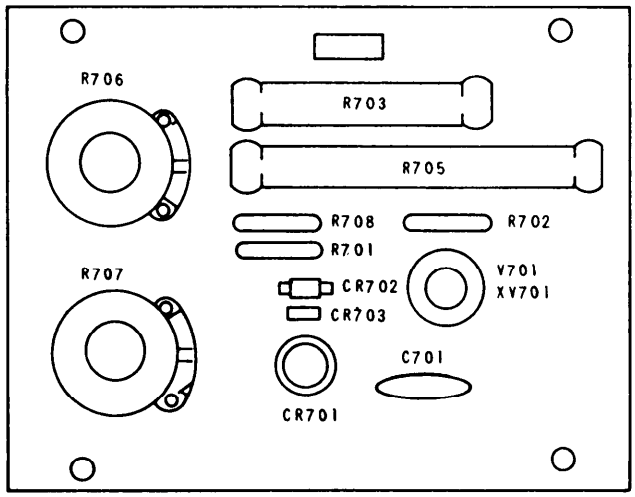


Figure C-5. circuit card assembly A700.

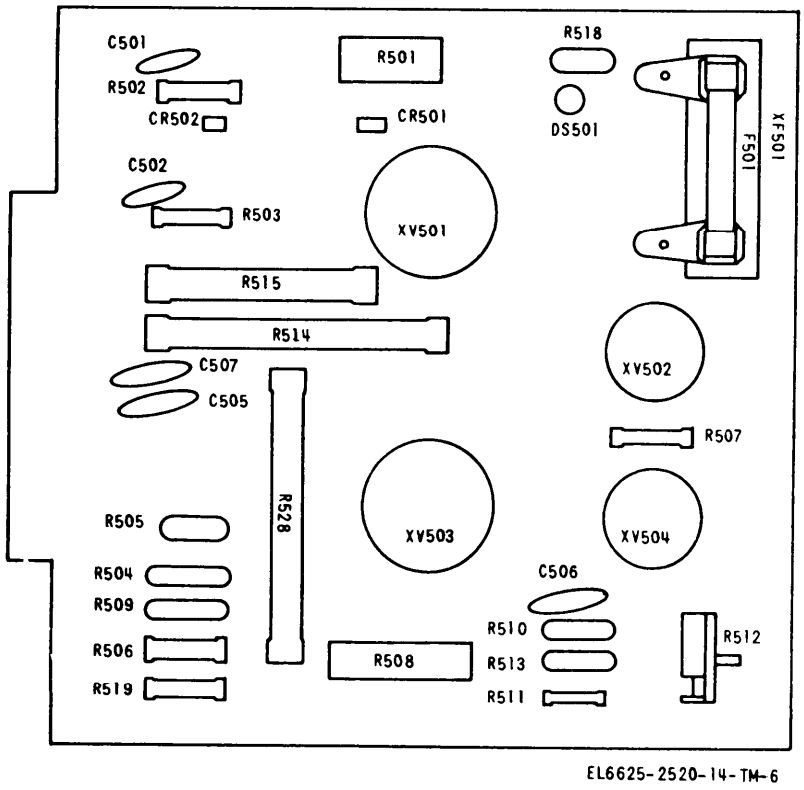


Figure C-6. Circuit card assembly A500.

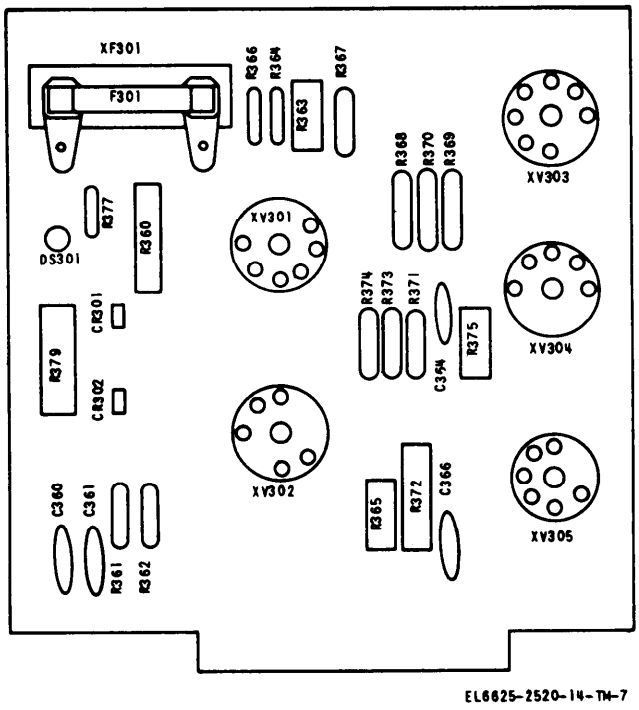


Figure C-7. Circuit card assembly A300.

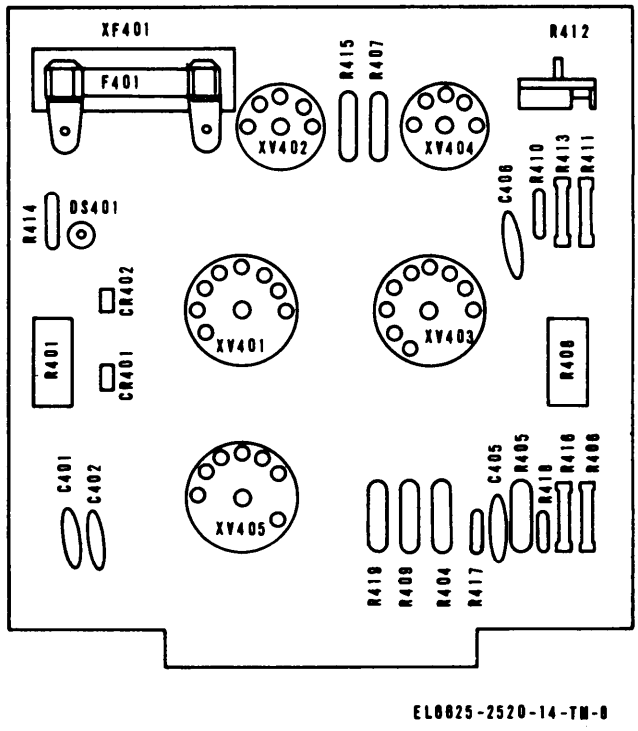


Figure C-8. Circuit card assembly A400.

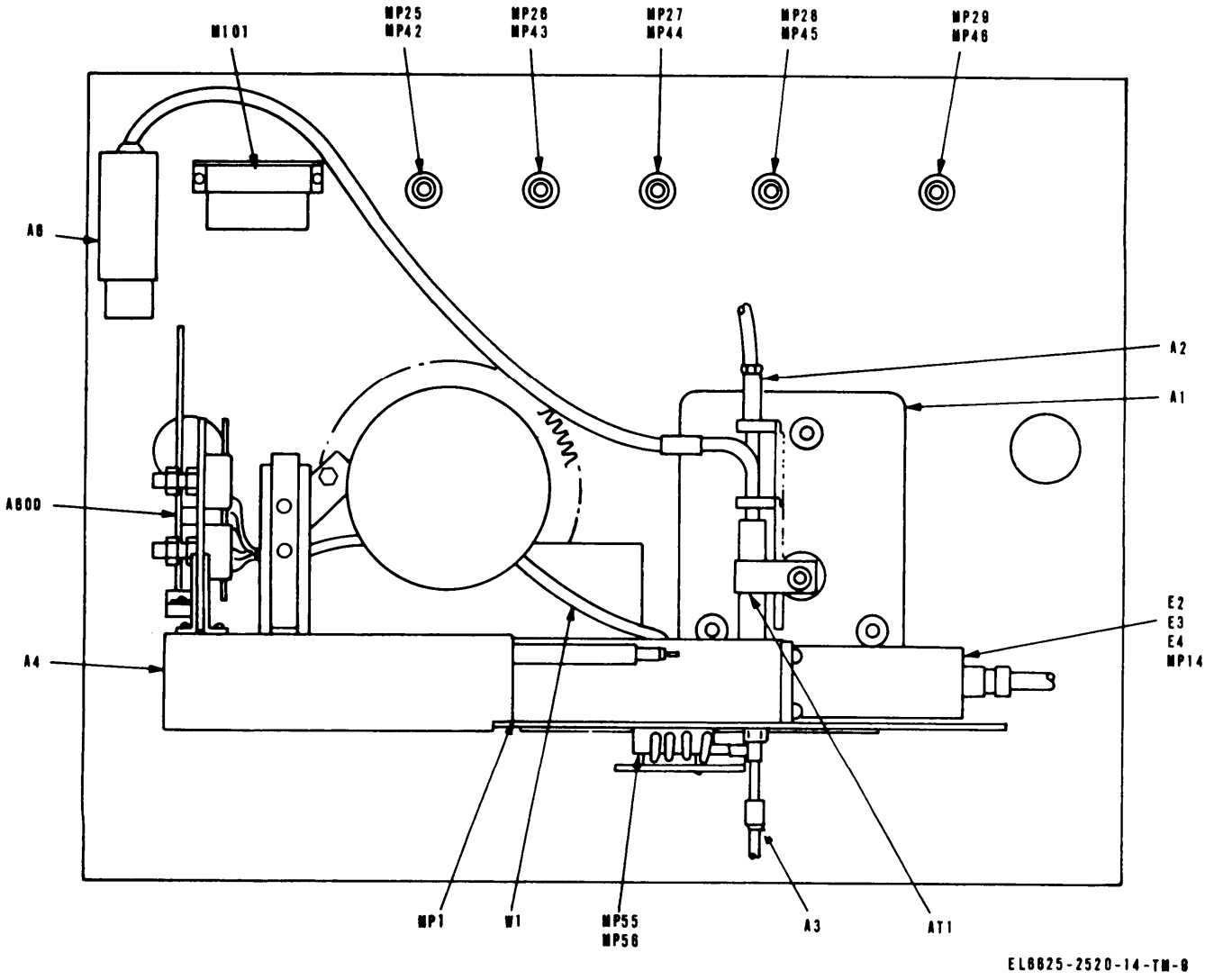


Figure C-9. Front panel assembly A2, interior.

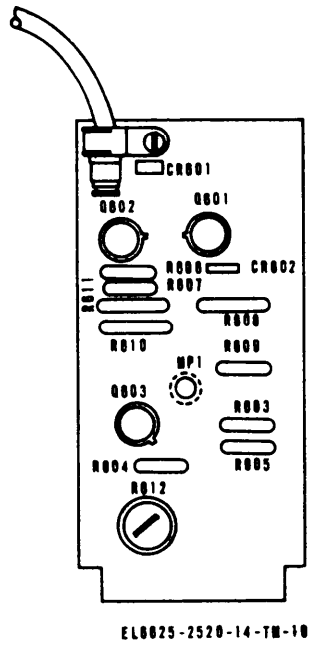


Figure C-10. Circuit card assembly A600.

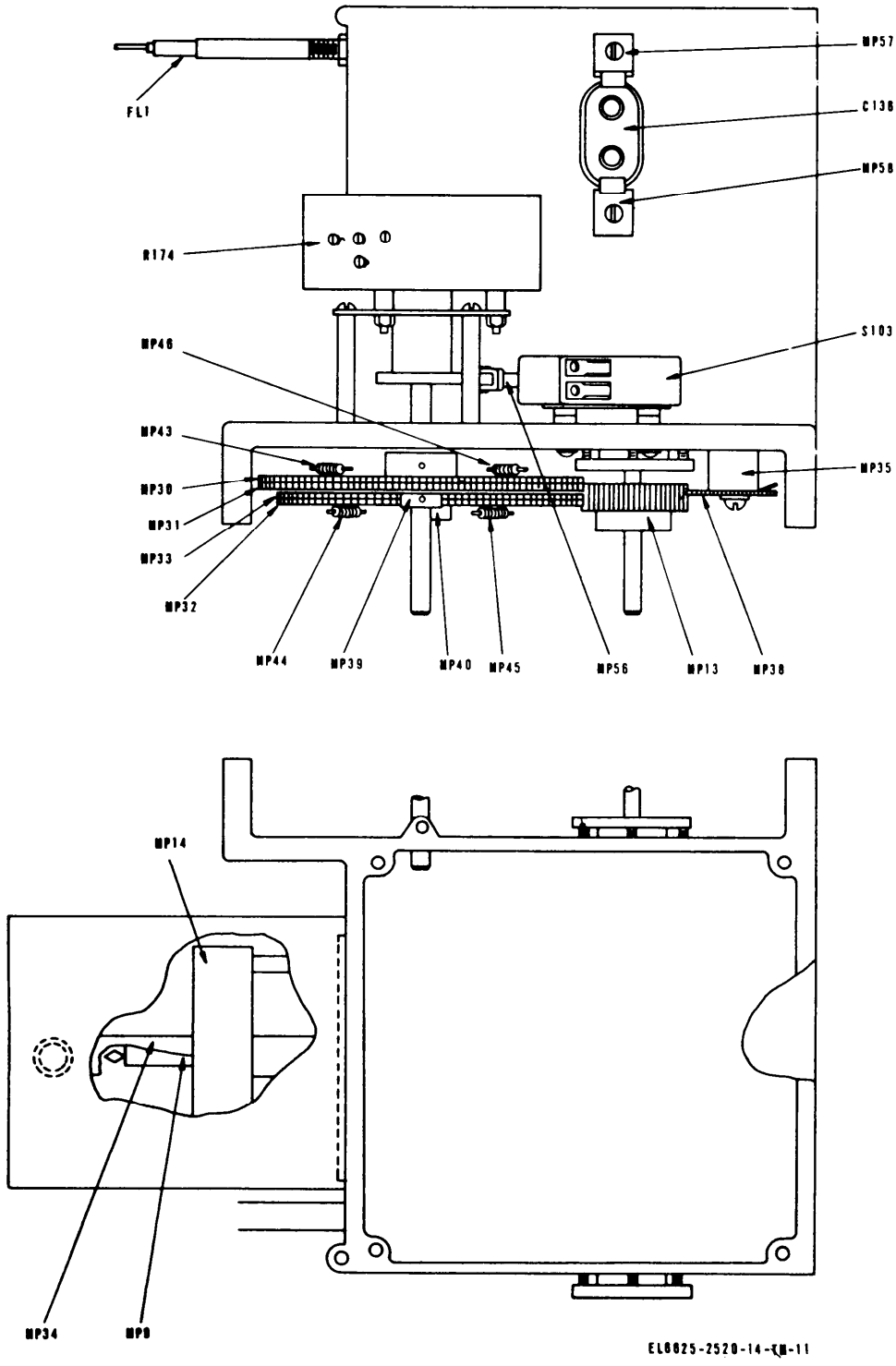


Figure C-11. Frequency control assembly A2A4.

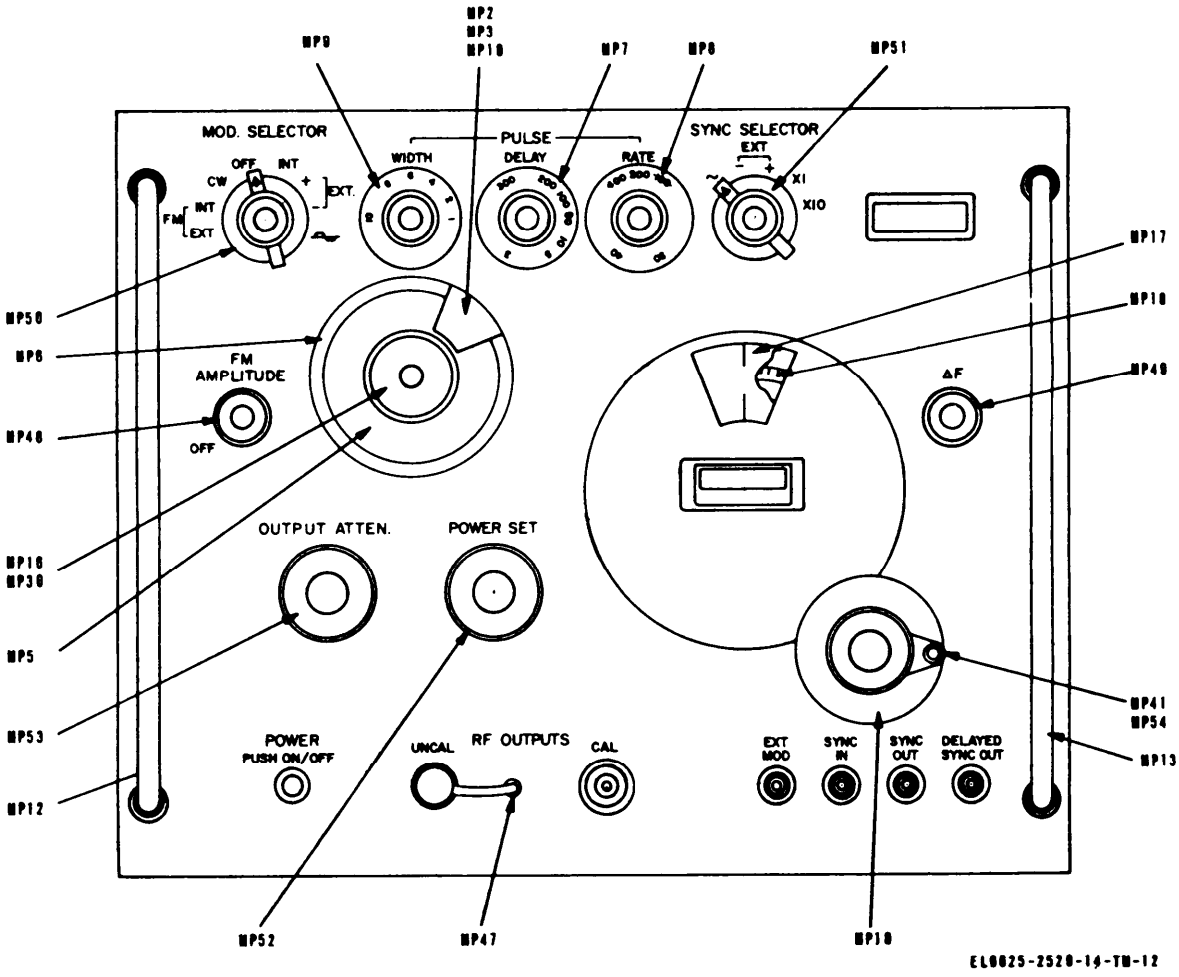


Figure C-12. Front panel assembly A2, exterior.

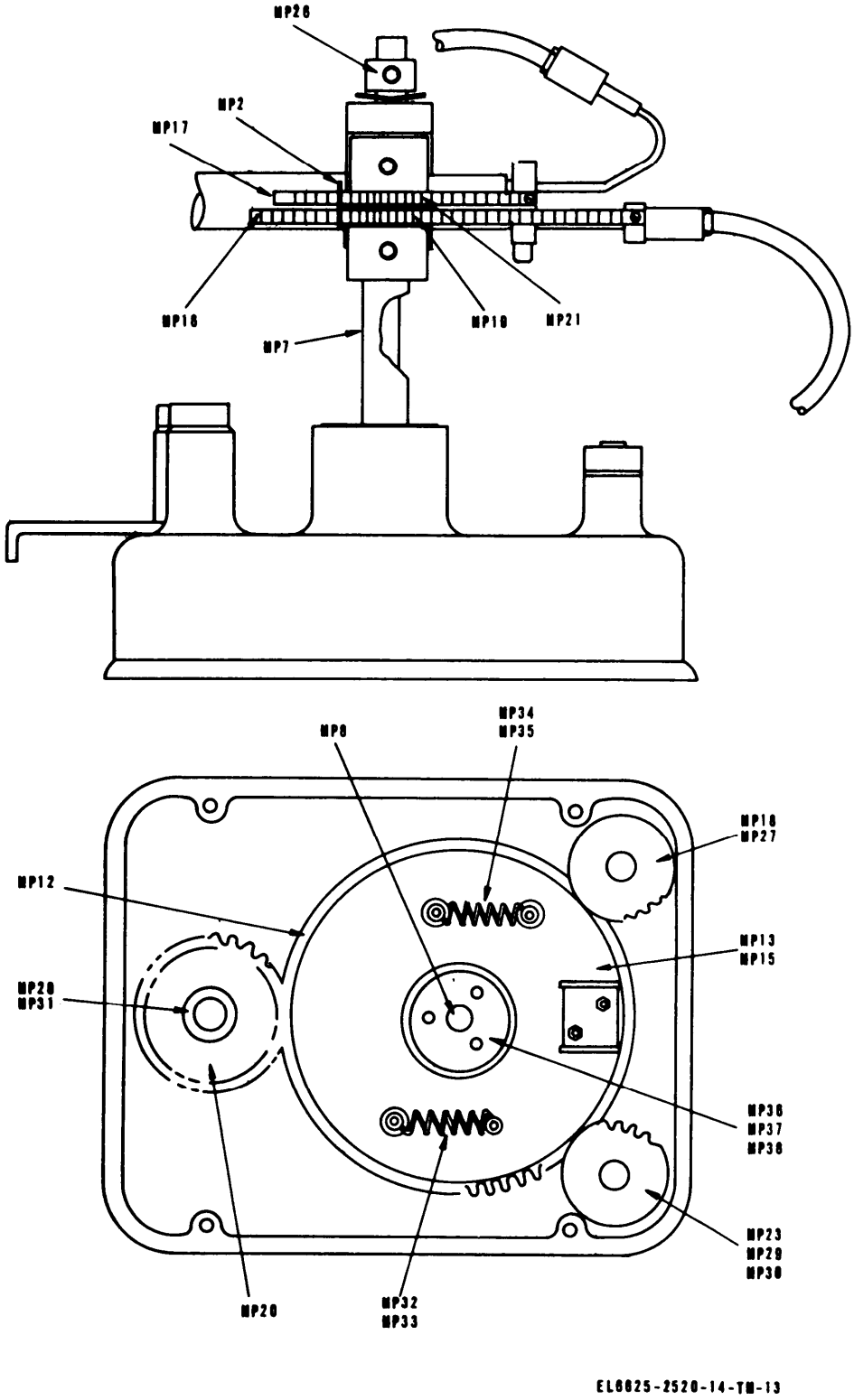


Figure C-13. Drive assembly A2A1.

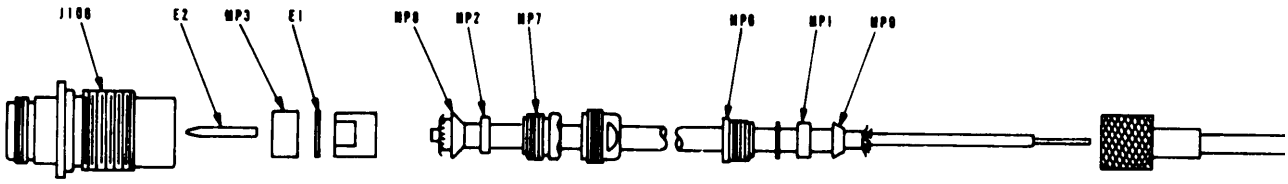


Figure C-14. Probe assembly A2A3.

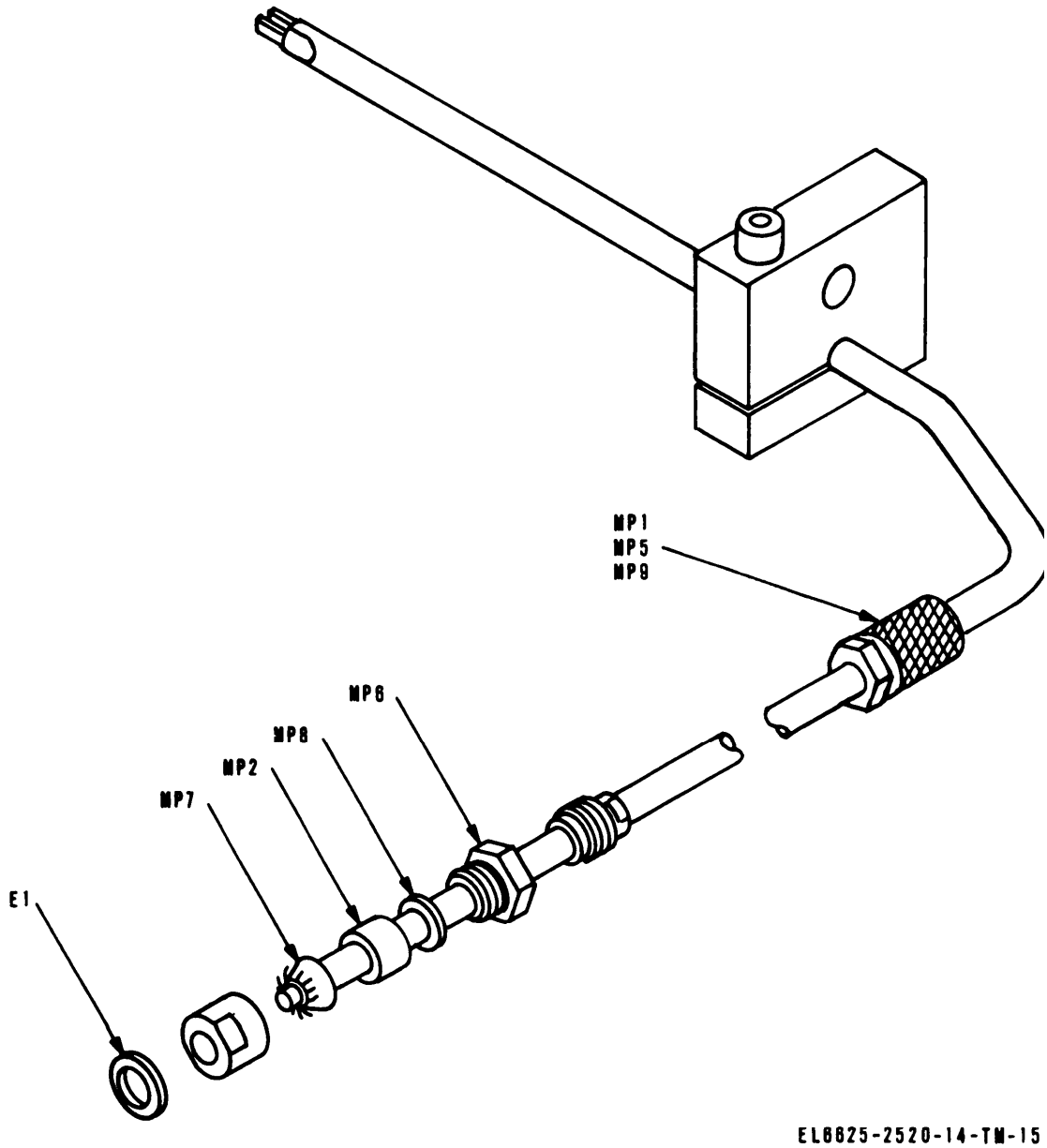


Figure C-15. Probe assembly A2A2.

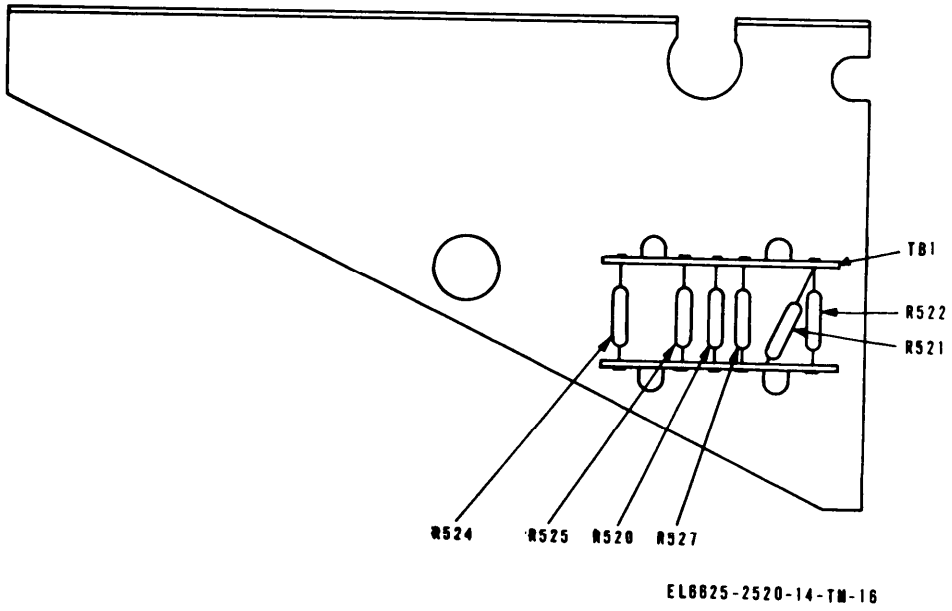


Figure C-16. Divider assembly A2A5.

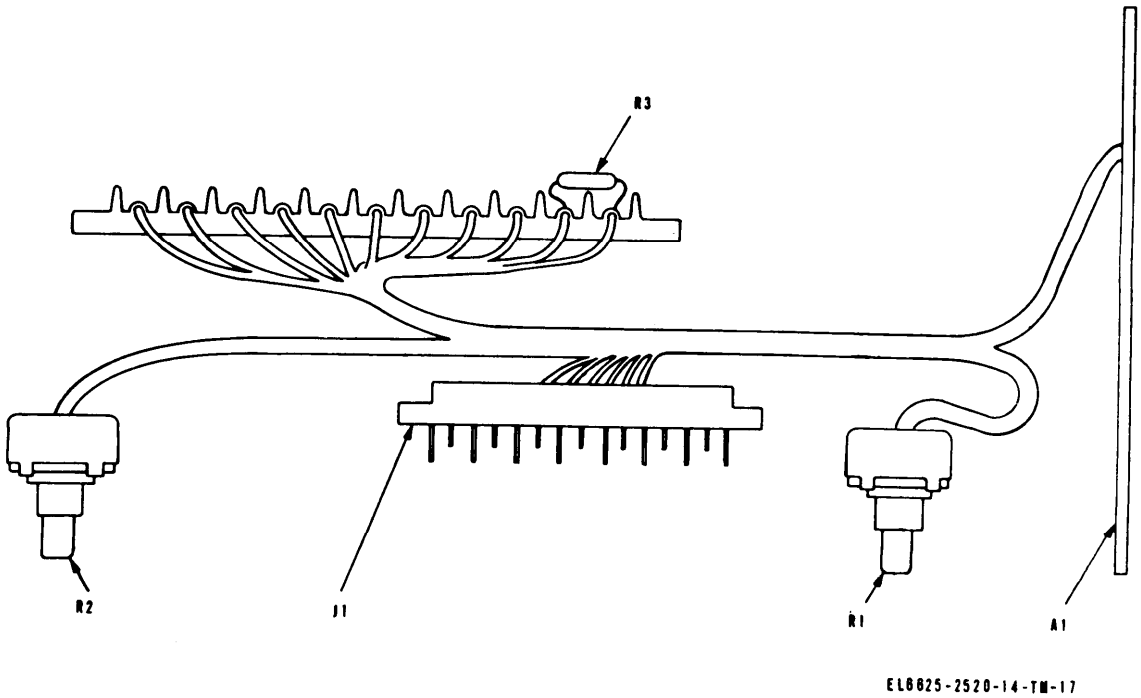


Figure C-17. Wiring harness A2W1.

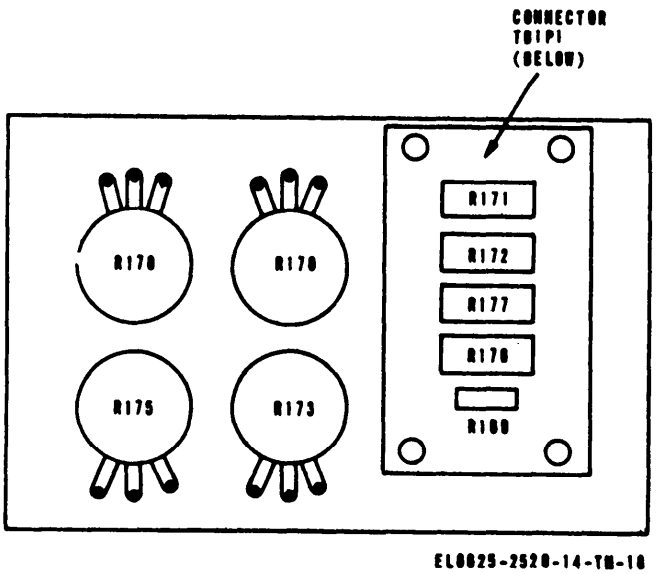


Figure C-18. Resistor board assembly A2W1A1.

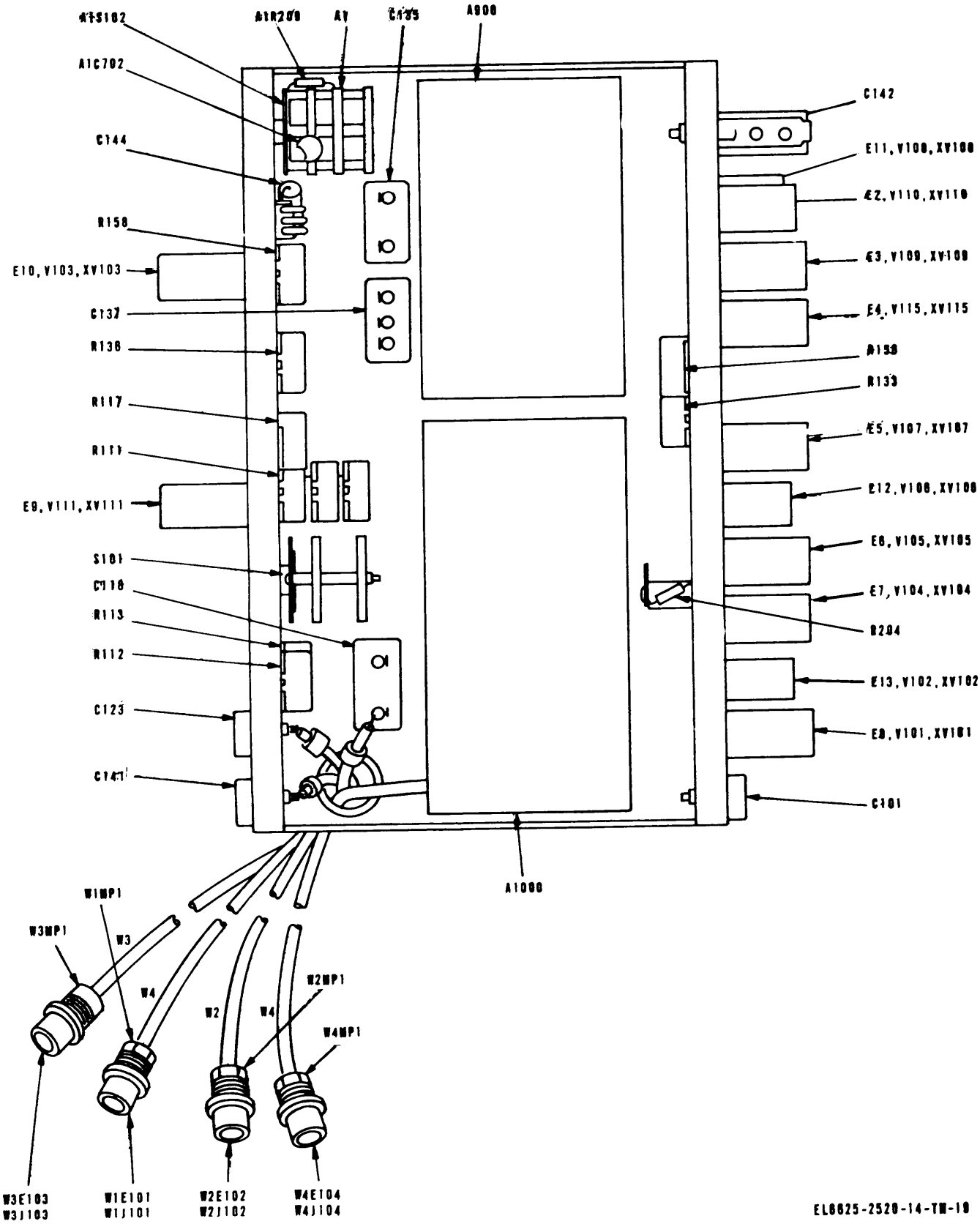
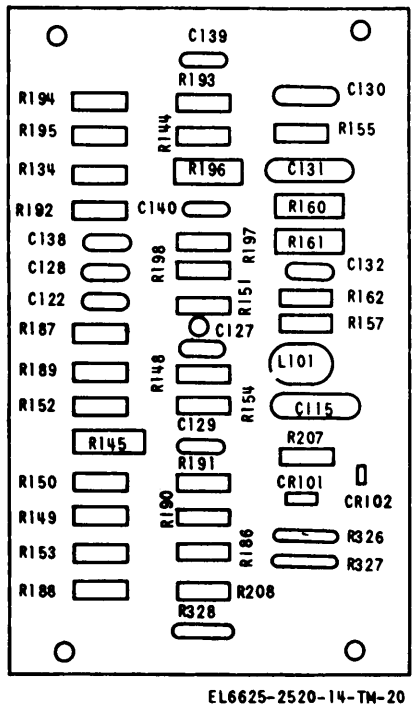
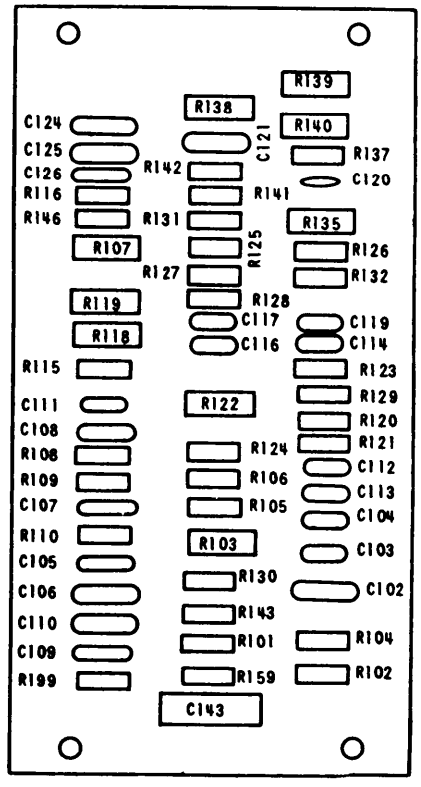


Figure C-19. Pulser assembly A1.



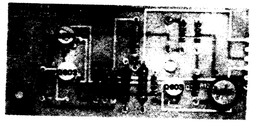
EL6625-2520-14-TM-20

Figure C-20. Circuit card assembly A1A900.

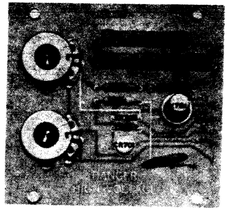


EL6625-2520-14-TM-21

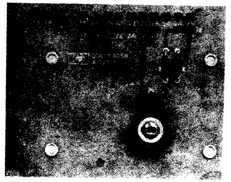
Figure C-21. Circuit card assembly A1A1000.



Component Identification, A600



Component Identification, A700



Component Identifications, A800

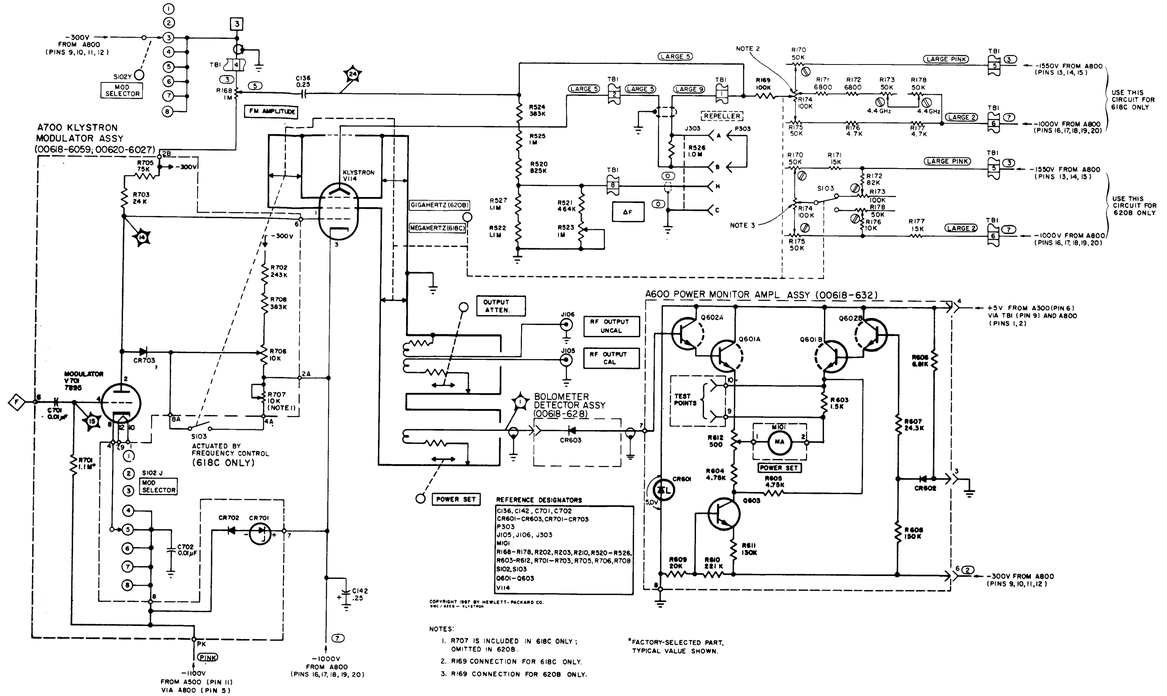
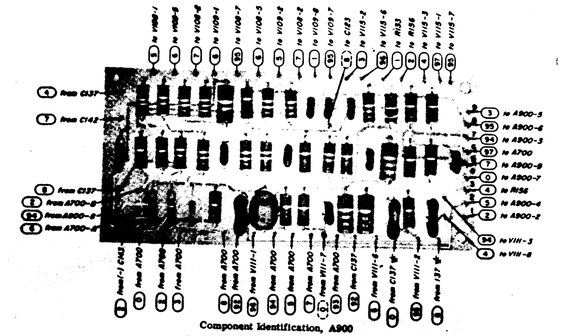
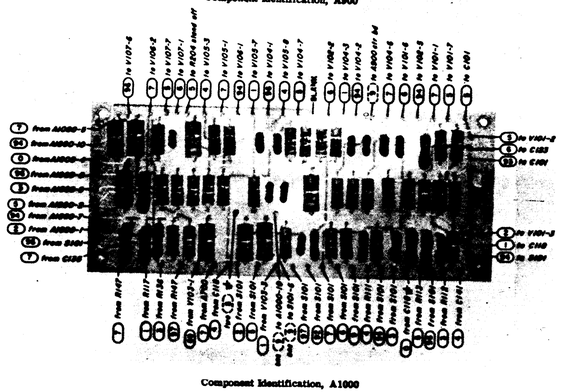


Figure FO-1. Klystron section.



Component Identification, A900



Component Identification, A1000

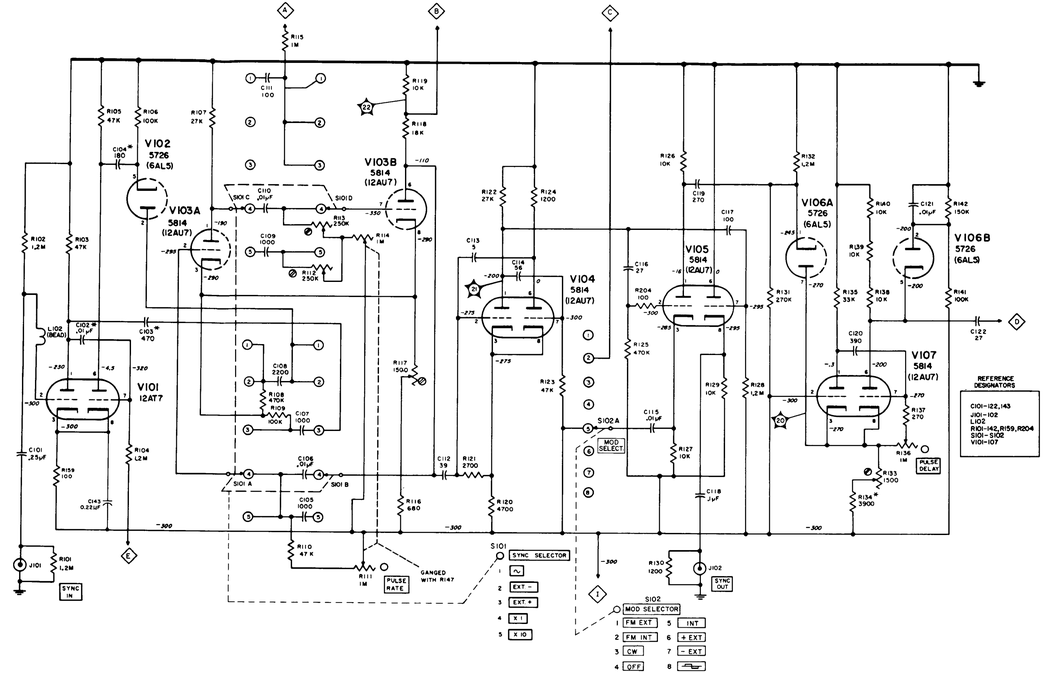
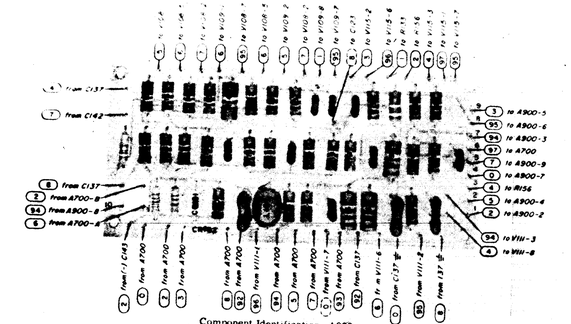
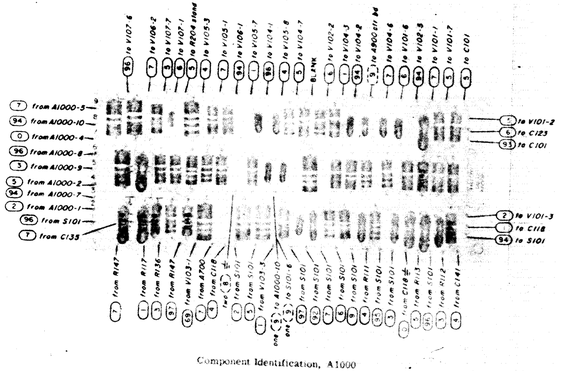


Figure FO-2. Modulation section.



Component Identification, A900



Component Identification, A1000

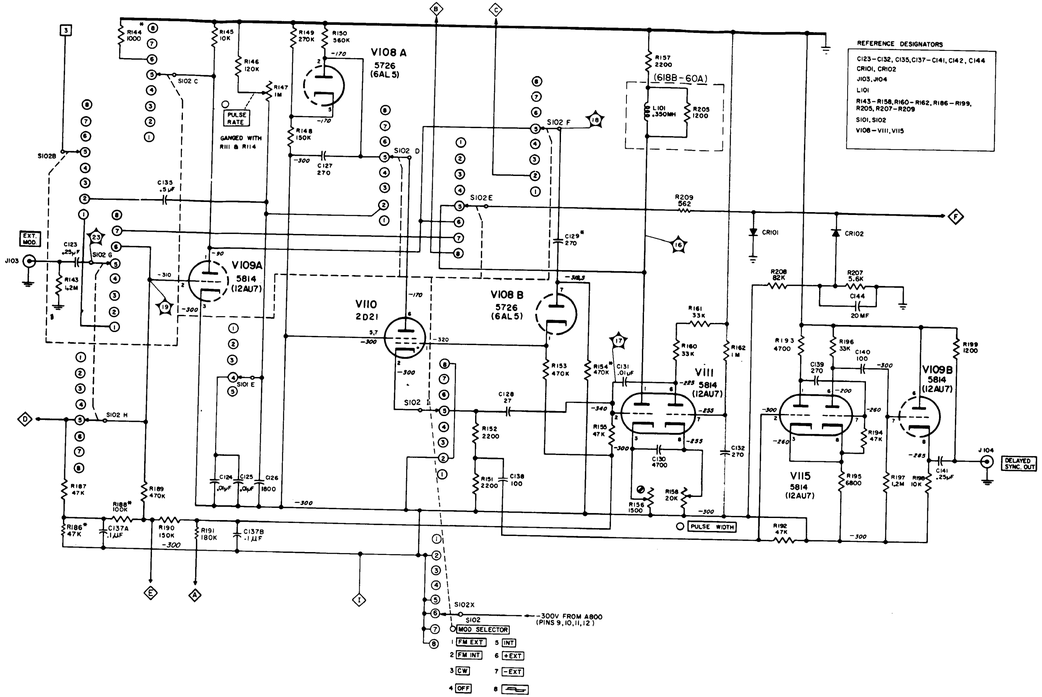
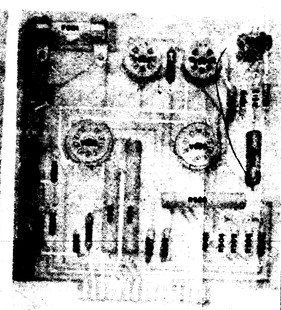
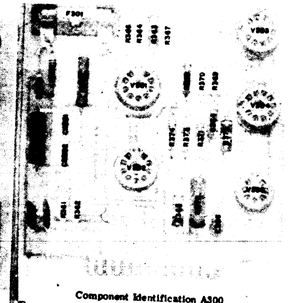


Figure FO-3. Modulator section.

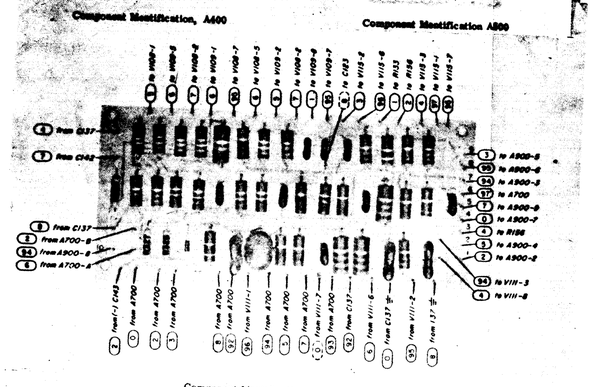
Component Identification, A400



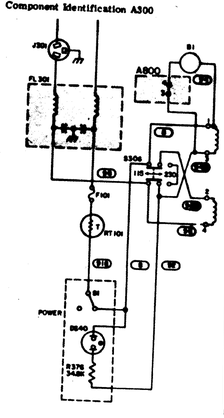
Component Identification A800



Component Identification A300



Component Identification, A900



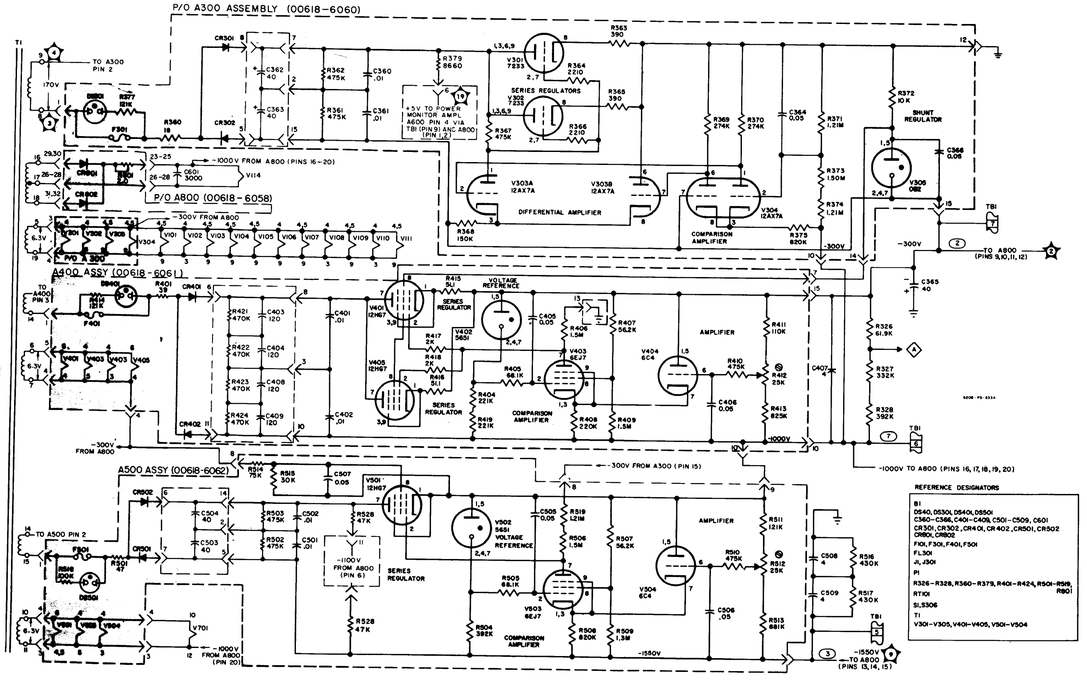


Figure FO-4. Power supply section.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army

USASA (2)
CNGB (1)
ACSC-E (2)
USAMB (10)
AMC (1)
TECOM (2)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
2d LOGCOMD (10)
ARADCOM (1)
OS Maj Comd (3)
USARPAC (8)
USARYIS (8)
USASTRATCOM (5)
USA STRATCOM-PAC (10)
USASTRATCOM Sig Gp Okinawa (15)
USASTRATCOM Sig Gp Taiwan (10)
USASTRATCOM Sig Gp-T (2)
USAESC (20)
USASCS (50)
USASESS (5)
USAINTS (3)
Army Dep (1) except
SAAD (20)
TOAD (14)
LBAD (5)
LEAD (5)
Gen Dep (pat) (2)
Sig Sec, Gen Dep (pat) (2)
Sig Dep (pat) (2)
USACSA (3)
MAAG, Republic of China (2)
Sig FLDMS (pac) (2)
Units org under fol TOE:- 1 ea.
11–158
11-302
29–134
29–136

ARNG & USAR: None.

For explanation of abbreviations used, see AR 310-50.

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