

INSTRUCTION MANUAL

Clegg VENUS

SSB Transceiver For 6 Meters

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I. DESCRIPTION

A. General (See Figure 1)

The Clegg Venus is a high quality compact attractively styled SSB receiver and transmitter that puts you on 50 mc single sideband without all the fuss, bother and expense associated with adopting low frequency SSB exciters, crystal controlled converters, relays, linear amplifiers, etc.

Employing all the latest circuits techniques, the Venus, in one small package, provides a combination of advanced operating features and conveniences heretofore unavailable in rigs at any price.

B. Operating and Performance Features

1. A nuvistORIZED front end for maximum sensitivity and extremely low noise figure.
2. Crystal lattice filter in both receive and transmit positions.
3. Balanced beam tube modulator.
4. Receiver Offset control provides ± 1.5 KC tuning of the receiver frequency, independently of transmitter. This is especially desirable for net operation where many stations are frequently off frequency.
5. An effective peak noise limiter functions with the diode detector in AM operation while adjustable threshold limiting provides excellent rejection of impulse noise on SSB and CW.
6. The tuning dial assembly that drew raves from thousands of ZEUS and INTERCEPTOR users has been further refined for use in the VENUS, to accurately read 1 KC per division, so desirable for SSB operation. The Main tuning dial tunes 10 KC per revolution.
7. Slow AVC release is carefully designed to the special requirements of VHF SSB.
8. An expanded scale relative output meter permits simple and precise (front panel controlled) carrier balance adjustment, and output tuning indication. The same meter also serves as an accurate S meter on receive.
9. A second panel meter continuously monitors cathode current of transmitting output amplifier tube.

10. Broadband circuits throughout provide maximum simplicity and ease of tune-up. The only transmitter tuning requirement is re-peaking of the final amplifier plate when large frequency changes are made.
11. Shaped, blocked-grid keying combined with linear circuitry and extreme frequency stability insure unexcelled CW performance.
12. A separate front panel control provides for smooth injection of carrier for excellent quality AM operation and adjustable CW output.
13. Accessory connector is provided for connection and control of external linear amplifier and/or separate receiver.
14. Each Venus is equipped with a high quality S-S #551-001 high output, shielded microphone matched to the transmitter input for maximum talk power.

C. Specifications

1. Electrical

a) Transmit

Frequency Range:	49,975 to 50,475 KC, Standard (other ranges available on special order).
Power Ratings:	85 watts PEP input -
SSB Performance (9 MC lattice filter)	Unwanted sideband down more than 50 db at 1000 cycles. Carrier suppression greater than 56 db. Distortion products down more than 30 db at full ratings.
Frequency Stability:	Less than 500 cycle warmup drift after first twenty minutes. Less than 100 cycle/hour drift after warmup.

b) Receive

Frequency Range:	Same as TRANSMIT
Frequency Stability:	Same as TRANSMIT
Sensitivity:	.25 uV for 6 db S/N on AM .1 uV for 6 db S/N on SSB
Selectivity:	2.7 KC at 6 db, less than 6 KC at 50 db.
Spurious Responses:	Images and IF leak through down more than 60 db

Overload Characteristics: Less than 5% cross modulation results from any two signals separated by more than 20 KC if stronger signal is less than 2 MV across 50 ohm input.

AVC Characteristics: Less than 10 db change in AF output for input change from 1 uV to 400 uV (52 db). Fast attack, panel selectable release times of .15 or 1.2 seconds.

AF Power Output to Speaker: More than 2 watts at 3.2 ohms.

c) Power Supply

Power requirements are met by the ~~Requires Sencore~~ Venus AC #800-013, 115 Volts AC, 60 cps input Power Supply/speaker combination (as well as by other commercially available Power Supply/speaker packages (See Section II, Installation).

2. Tube Lineup (See Figure 2)

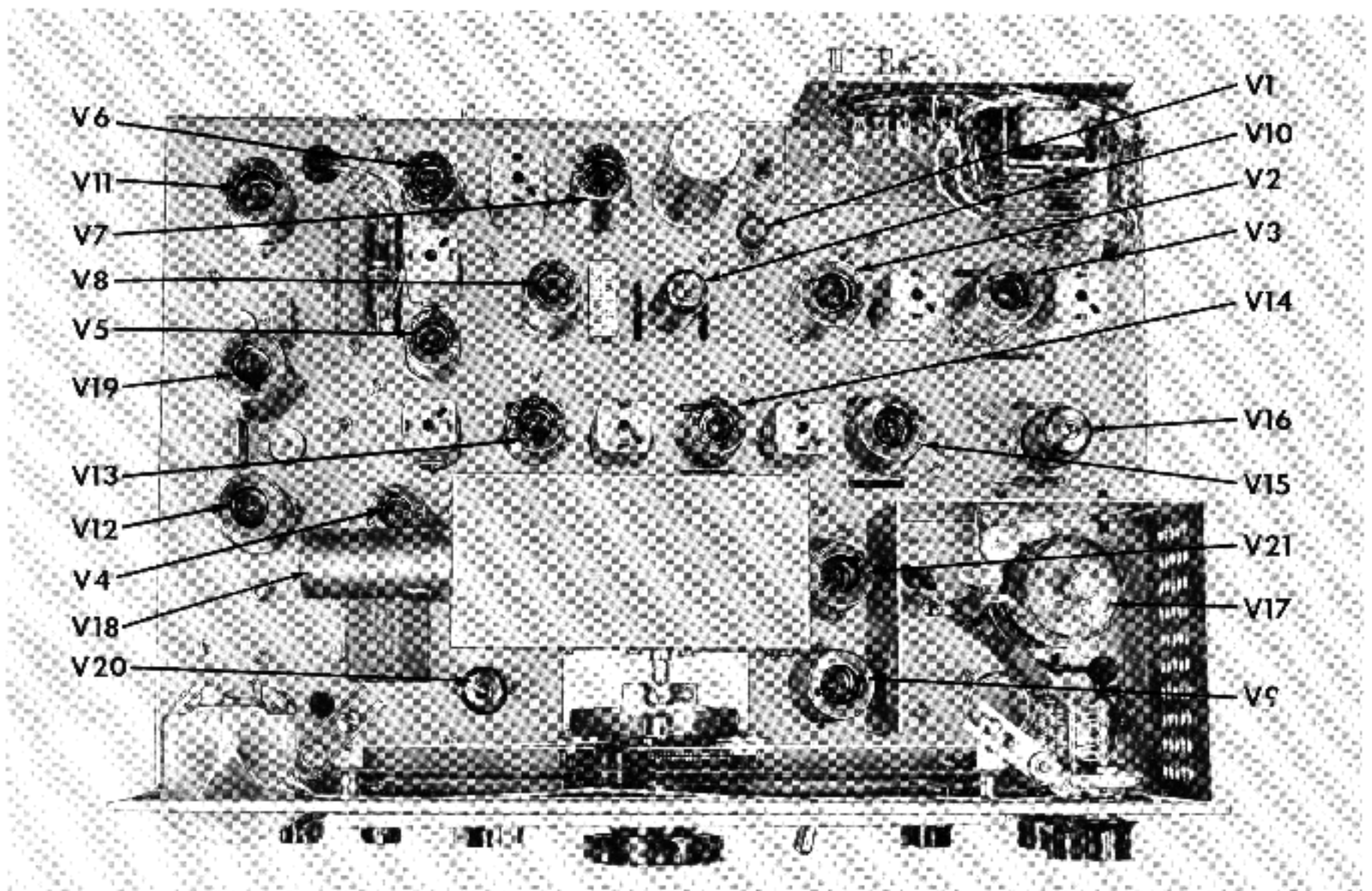
<u>Tube No.</u>	<u>Tube Type</u>	<u>Receive</u>	<u>Transmit</u>
V1	6CW4	RF Amp	--
V2	6EH7	1st Mixer	--
V3	6EH7	2nd Mixer	--
V4	12BA6	9 MC Amp	--
V5	12BE6	3rd Mixer	--
V6	12BA6	455 KC IF	--
V7A	12AL5/2	AM DET	--
V7B	12AL5/2	AM ANL	--
V8	12BE6	Prod. Det.	--
V9A	12DW7/2	1st Audio	--
V9B	12DW7/2	S-Meter Amp.	Relative Output Meter Amp.
V10	12AQ5	Audio Output	--
V11	12DW7	--	Speech Amp.
V12	7360	--	Bal. Mod.
V13	12AU6	--	1st Mixer
V14	12AU6	--	14 MC Amplifier
V15	12BA7	--	2nd Mixer
V16	12BY7	--	50 MC Driver/Amp.
V17	6883	--	Final Power Amp.
V18	6DJ8	5.0 to 5.5 MC Master	Osc. and Cathode follower
V19A	12AU7/2	--	8998.5 KC carrier, osc.
V19B	12AU7/2	3rd Mixer Osc.	--
V20	6A2	VOLTAGE	REGULATOR
V21	668A	36 MC Osc.	36 MC Osc.

3. Physical

15" wide by 7" high by 10-1/2" deep. Net shipping weight approx. 22 lbs.

TUBE LINEUP

<u>Tube No.</u>	<u>Tube Type</u>	<u>RECEIVE</u>	<u>TRANSMIT</u>
V1	6CW4	RF Amp	-
V2	6EH7	1st Mixer	-
V3	6EH7	2nd Mixer	-
V4	12BA6	9 MC amp	-
V5	12BE6	3rd Mixer	-
V6	12BA6	455 KC IF	-
V7A	12AL5/2	AM DET	-
V7B	12AL5/2	AM ANL	-
V8	12BE6	Prod. Det.	-
V9A	12DW7/2	1st Audio	-
V9B	12DW7/2	S-Meter amp.	Relative Output Meter Amp.
V10	12AQ5	Audio Output	-
V11	12DW7	-	Speech Amp.
V12	7360	-	Bal. Modulator
V13	12AU6	-	1st Mixer
V14	12AU6	-	14 MC Amplifier
V15	12BA7	-	2nd Mixer
V16	12BY7	-	50 MC Driver/Amp.
V17	6883	-	Final Power Amp.
V18	6DJ8	5.0 to 5.5 MC Master Oscillator and Cathode follower	8998.5 KC carrier osc.
V19A	12AU7/2	-	-
V19B	12AU7/2	3rd Mixer Osc.	-
V20	0A2	VOLTAGE	REGULATOR
V21	6U8A	36 MC Osc.	36 MC Osc.



II. INSTALLATION

A. Unpacking

The Venus has been packed with adequate internal carton bracing and cushioning to withstand normal handling in shipment on common carriers. Examine the carton exterior for signs of severe damage (crushing, piercing, etc.) In the event of obvious serious damage, examine the equipment carefully to determine the extent of internal damage, save packing material and make claim against transportation company.

Check all front panel controls for freedom of action and observe that all tubes and crystals are firmly seated in their sockets. Complete and mail the equipment registration card.

Many customers have found that saving the shipping carton and the internal cushioning is a great convenience in the event of subsequent need for reshipment or prolonged storage.

B. Installation (Fixed Station)

1. Power Supply/Speaker combination

~~Speakers-Senders~~ Venus AC #800-013 or suitable commercial supply furnishing:

+275 volts at 125 Ma
+650 to 750 volts at 150 Ma
-100 volts at 10 Ma
12.6 volts at 5.5 ampere AC or DC with built in
4 ohm speaker

2. Antenna Connection

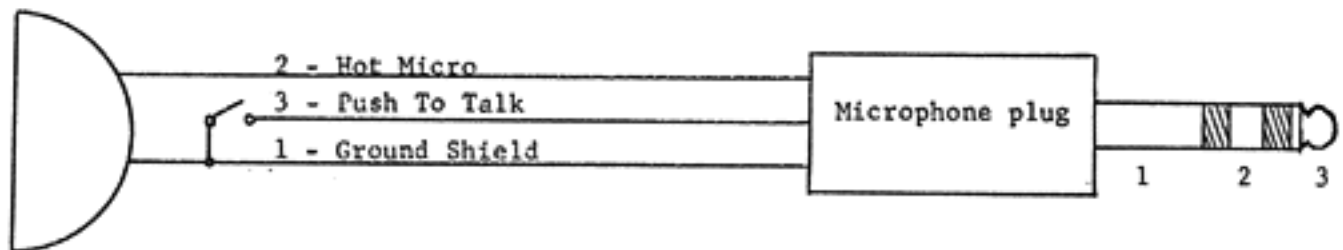
Type UHF (SO-239) to match with PL259 male plug. The Venus is designed for use with 50 to 75 ohm loads. Typical of all VHF equipment, its performance is very much influenced by the antenna system. A well matched three element beam located at least 20 feet above ground with RG-8AU or better cable, is considered minimum for satisfactory performance. For mobil operation, a carefully matched "halo" will be found satisfactory.

3. Speaker

Self contained and automatically connected with the Venus AC #800-013 Power supply. Speaker connections are pins #5 (GRD) and #7 on power supply Jones plug. A speaker of 3 to 6 ohms impedance should be used. An auxiliary speaker output jack is provided on the Venus AC #800-013 Power Supply

4. Microphone

The Clegg audio circuits and the ~~551-001~~ #551-001 microphone furnished with the Venus have been carefully matched for maximum performance. Such other microphones as the Electro Voice #664, Astatic D-104 and simialr high impedance units will provide satisfactory operation where a desk microphone is desired. Since normal TRANSMIT-RECEIVE switching of the Venus for SSB or AM is performed only via the PTT control system, any alternate microphone must be of the type that provides PTT operation. The microphone employs a three circuit plug wired per figure 3 below:



Microphone

FIG. 3

5. Key Jack is of the RCA or phono type and is located on the rear apron of the chassis. A matching plug is furnished (See Section III, A5).
6. Auxiliary connectors are provided for antenna switching and connection and control of an auxiliary linear amplifier and/or an external separate receiver.
7. Jacks are provided at the rear of the Venus (See Figure 4) for connecting the Clegg SS Booster. When the Booster is not used, the Jumper (supplied) must be in place.

RCA phono connectors adjacent to the antenna connector and the three circuit terminal strip adjacent to the power plug at the rear of the unit per figure 4 provide these facilities.

111. OPERATION

A. RECEIVER OPERATION

1. Set Controls as follows: (See Figure 1)
 - a) RECEIVER AUDIO TO AC OFF position
 - b) SPEECH GAIN slightly clockwise (off CW position)
 - c) CARRIER BALANCE to 12 o'clock
 - d) RECEIVER RF GAIN to maximum clockwise
 - e) CARRIER LEVEL to full counter-clockwise position (past switch)
 - f) RECEIVER OFFSET TO 0
 - g) AVC to fast
 - h) DETECTOR to CW-SSB
 - i) NOISE LIMITER TO OFF
 - j) AMPLIFIER PLATE TUNE and LOAD to 12 o'clock
2. Connect interconnecting cable from power supply/speaker cabinet to Jones plug at rear.
3. Connect antenna to UHF coaxial plug at rear. Be sure that jumpers are firmly seated in phono plugs adjacent to ANT connector. See Page 10A Fig. 4
4. Insert microphone plug into the MIKE jack.
5. Connect KEY to KEY JACK at rear. IF CW IS NOT CONTEMPLATED or KEY and CABLE is not available, the phono plug supplied with the unit must be shorted and inserted in the key jack before proceeding with tuneup.
6. Connect AC cable from power supply to 110-120 volt, 60 cycle source.
7. Turn RECEIVER AUDIO to about 9 o'clock and observe that dial lamps light. S Meter will normally go to full scale and return to near zero as unit warms up.
8. Receiver is now in operation and performs in the conventional manner. It is suggested that some tuning of the receiver be done on different signals before proceeding with transmitter operation. The following notes will be helpful:
 - a) AVC: Use FAST AVC while tuning and listening under noisy band conditions. SLOW AVC will be found desirable in most SSB and CW operation.
 - b) NOISE Limiter: The noise Limiter will be found to behave quite differently between the AM and CW and SSB Modes. On AM, the operation is automatic and is simply activated by advancing the panel control off the switch position. On CW and SSB, the limiter is manually controlled by slowly advancing the control in a clockwise direction until most effective noise limiting (consistent with acceptable distortion) is attained.

- c) Tuning: The narrow IF band width of the Venus will accommodate only one sideband of a voice station. On SSB, the internal oscillators are factory adjusted for Upper Side Band reception. AM stations should be tuned so that either upper or lower sideband is received. This can best be established by tuning slightly to either side of the maximum S meter reading. When an interfering signal exists on one sideband, it will be found that the other sideband can be copied without interference.
- d) Receiver RF Gain: The Receiver RF Gain will normally be set at maximum but it may be found desirable to reduce gain when working strong local CW or SSB stations.
- e) S Meter: The S Meter is calibrated so that 24 microvolts input produces an S9 meter reading, with each S unit indicating approximately 6 db. That is, each S unit represents an increase of 2 times in input signal voltage or 4 times in input signal power. A 1 μ V signal will normally be approximately S4-1/2; A 750 μ V signal will produce a 30 db over S9 reading.
- f) Frequency Display: Dial readout and accuracy will be within 2 KC over the range from 50,050 and 50,250 KC and better than 4 KC at any other point. The vernier dial window reads directly in kilocycles over the range from 50,000 and 50,350 KC. When aligned at the factory, the dial reading error at 50,100 KC is less than 500 cycles. Reset to less than 1 KC is possible over the full range.
- g) Receiver Offset: This control may be considered as an electrical vernier or bandspread control having a calibrated range of \pm 1.5 KC. The VENUS is designed to include two such controls which are automatically switched between receive and transmit. The TRANSMITTER OFFSET control, located at the rear of the unit affects transmitting frequency only, whereas the RECEIVER OFFSET control affects receiver tuning only. When properly calibrated, with the RECEIVER OFFSET at 0, the transmitter and received frequencies will be identical. If the station being received drifts in frequency or if a "round table" of several stations are being worked, it is possible with the RECEIVER OFFSET control to maintain proper receiver tuning without changing transmitting frequency.
- h) S Meter Adjust: The S Meter adjustment control located on the rear chassis apron should be adjusted for zero meter reading after the unit has been warmed up for 15 minutes or more with antenna disconnected and the RF gain set at minimum.

9. The VENUS may be adapted for use as a conventional crystal controlled 50 to 51 MC converter with 14 to 15 MC output. Normal transceiver operation is unaffected. A phono type receptacle J 2 is provided adjacent to the three terminal strip on the rear chassis apron. A 20" to 30" length of RG-58 should be used between this output and the antenna input of a 14 MC communications receiver. Muting of the 14 MC receiver can be accomplished by use of the relay contacts on the rear apron terminal strip.
10. The foregoing circuit permits the use of a visual panoramic display on any model visual bandscanning device designed or adaptable to 14 MC input. Display bandwidth will be approximately 400 KC centered at 50.2 MC.

B. TRANSMITTER OPERATION: INITIAL ADJUSTMENT

1. The transmitter functions of the VENUS can be activated by either depressing the "push to talk" button on the microphone (for AM or SSB) or turning the SPEECH GAIN control completely counterclockwise to the CW switched position. The CW position in conjunction with the CARRIER control provides a convenient "tune-up" facility. To UTILIZE THIS FACILITY IT IS NECESSARY THAT A SHORTED PLUG OR A CLOSED TELEGRAPH KEY BE CONNECTED AT THE KEY JACK.
2. Set controls as follows:
 - a) MAIN TUNING DIAL TO 50,150 KC
 - b) CARRIER BALANCE AT 12 o'clock
 - c) CARRIER LEVEL to full counterclockwise position (past switch).
 - d) AMPLIFIER PLATE TUNE and LOAD to 12 o'clock.
 - e) SPEECH GAIN switch to CW position (full ccw).
3. Adjust BIAS control on rear apron so 0-200 Ma CATHODE CURRENT Meter reads between 25 and 30 Ma.
4. CW and SSB TUNE UP:

Adjust CARRIER BALANCE control slowly so both meters read minimum, after reducing Speech Gain Control to minimum. NOTE: If SS Booster is included in your equipment, adjustment of the internal control C4 (below S Meter) may be helpful to get the lowest reading.
5. Repeat step 3 (BIAS adjustment) if necessary.
6. Insert carrier by means of CARRIER LEVEL control. Advance control to full clockwise position.

7. Adjust both AMPLIFIER PLATE TUNE and LOAD CONTROLS for maximum indication on upper meter (S Meter). The two controls will be found to interact, but with some small practice, it will be found that the TUNE control will principally affect the upper meter (RELATIVE OUTPUT) and the LOAD control will affect cathode current. The correct final adjustment will be that which yields a maximum reading on the top meter and a dip or minimum reading on the lower meter. If CATHODE CURRENT exceeds 130 Ma, the CARRIER LEVEL control should be backed down.

With a matched 50 ohm antenna load it should be possible to obtain nearly full scale reading on the output (upper) meter with approximately 120 Ma of CATHODE CURRENT. Tuned in this manner, the VENUS is ready for CW operation.

8. OPERATION-SSB:

To operate on SSB, the CARRIER LEVEL control is turned completely back (counter clockwise) past the switch position. The CARRIER BALANCE control is then adjusted carefully for lowest reading on the output meter. (This is easier to observe if the AVC switch is in the FAST position). This adjustment should be made by activating the transmitter either with the CW position on the SPEECH GAIN control or by using the push to talk microphone switch. In the latter case, it is important that the SPEECH GAIN be at minimum (not in CW Position). After balancing the carrier as above the SPEECH GAIN can be advanced while talking into the microphone until both CATHODE CURRENT Meter and OUTPUT meter both move up scale.

9. The preferred method for adjusting the SPEECH GAIN setting of any SSB transmitter is with an oscilloscope. However, in the absence of this instrument, the speech gain can be adjusted quite satisfactorily by observation of the two panel meters. During normal speech, with average male voice and with the AVC in the FAST position, the CATHODE CURRENT meter will normally swing up to 55 or 60 Ma and the OUTPUT meter will hover just above midscale. On sustained tones whistled into the microphone,

C. Maintenance Adjustments

1. TRANSMITTER OFFSET ADJUSTMENT (Control located on rear apron, See Figure 4). Adjustment of this control which is preset at the factory, should not normally be necessary unless several reliable reports indicate that your transmitter and receiver are not on exactly the same frequency.

The simplest procedure for making this adjustment is to engage in a three way QSO with two strong local SSB stations who are both on the same frequency. With the RECEIVER OFFSET control set exactly on 0, tune the two stations in for best intelligibility and most natural sound. Ask for a report as to whether your signal is high or low in frequency. (Your voice will sound excessively low if you are too low; it will sound excessively high pitched if you are high in frequency). Rotate the TRANSMITTER OFFSET control in small increments using push to talk break in to get a report for each increment. Continue this process until both stations report that you are on frequency.

2. DIAL CALIBRATION. The dial calibration of the VENUS has been factory adjusted to meet or exceed specifications. If, due to replacement of tubes or extremely rough handling, it becomes necessary to correct dial calibration, the following procedure should be followed:

- a) Remove SNAP-PLUG from left side of cabinet directly behind S Meter.
- b) Observe that there are two trimmer adjustments accessible through this hole on the side of the VLO (Variable Local Oscillator) Compartment. The adjustment toward the front is L15 and the one to the rear is C9.
- c) A reliable frequency standard at two known frequencies near 50.1 MC and 50.3 MC is required. Set RECEIVER OFFSET to 0, DETECTOR to CW/SSB.
- d) Capacitor C9 should be adjusted so that dial calibration is exactly correct on the lower of the two frequencies.
- e) Tune receiver to zero beat on the higher frequency. If the dial reading is in error by more than 2 KC, readjust C9 for a correct dial reading.
- f) Return to lower frequency standard and reset L15 for correct reading at that frequency.

- g) Repeat steps (e) and (f) as many times as necessary to achieve correct dial reading at both frequencies. This process will be hastened somewhat if each adjustment of L15 or C9 is overdone slightly each time. That is, if a 3 KC error exists on step 6, a 4 KC correction should be performed.

3. CARRIER BALANCE. The VENUS is capable of providing a stable carrier suppression in excess of 50 db. Normally full balance of carrier can be achieved with the CARRIER BALANCE panel control. It may become desirable, after several hundred hours of operation, to adjust the Balanced Modulator quadrature balance control, C4 located on top of the chassis immediately in front of V12. The procedure is as follows:

- a) Tune both the VENUS and a stable 6 meter receiver to any frequency between 50.1 and 50.3 MC. Operate the VENUS in the CW position (being certain to close the KEY JACK circuit) and with the LEVEL control switched into the 0 position, adjust the CARRIER BALANCE control for minimum S Meter reading on the auxiliary receiver. By means of a long (7") and thin (3/32") screwdriver inserted through one of the cabinet perforations adjust capacitor C4. It will be found that small adjustment of C4 performed in conjunction with readjustment of the panel BALANCE control will permit reduction of the residual carrier to an almost undetectable level. When performed with care and patience it is possible to achieve a suppressed carrier level down more than 70 db below maximum peak output.

D. Use of Accessory Equipment:

The generous use of plugs, spare terminals, patch cords, etc. permits the use of many accessories and operating aids with the VENUS. Most of these provisions are self-evident from examination of the schematic diagram.

A. Receive Mode Functions

Incoming signals at 50 to 50.5 MC are amplified by V1 and converted to 14 MC in V2 utilizing a 36 MC crystal derived signal from V21. The coupling between V2 and V3 is broadbanded for a 600 KC bandwidth. V3 is a mixer stage whose injection signal is derived from 5.0 to 5.5 MC variable local oscillator (VLO). Output of V3 is at 9 MC. A crystal lattice filter at 9 MC provides approximately 3 KC selectivity.

The filter output is amplified in V4 whose gain is adjustable by the RF Gain control. The amplified 9 MC output of V4 is converted to 450 KC in mixer stage V5 and this signal is amplified by V6. V7A is an AM detector and AVC diode. V7B is a peak limiter for noise reduction on AM. V8 is a product detector with 450 KC crystal controlled injection. Semiconductor diodes are employed as a manually controlled peak noise limiter for CW and SSB. Two stages of audio amplification are furnished by V9A and V10.

V9B functions as a non-linear VTVM monitoring the AVC voltage applied to V5 and V6. Panel control of the AVC discharge time constant permits selection of fast or slow AVC release time.

B. Transmit Mode Functions

9 MC RF from V19A and audio from V11 are both supplied to balanced modulator, V12. The resultant 9 MC double sideband signal is fed to the crystal lattice filter where the lower sideband is removed. The remaining upper sideband signal is heterodyned to the 14 MC region in V13 whose injection signal is derived from the 5 MC VLO. As in the receiver section, the 14 MC amplifier is broadbanded. After amplification in V14 the 14 MC USB signal is heterodyned in V15 to 50 MC, V21 furnishing the necessary 36 MC injection. 50 MC USB output is amplified by both V16 and V17.

V9B and the related S meter are employed as an output meter on transmit. The scale is expanded greatly at the bottom end to facilitate accurate carrier balance adjustment. This scale expansion is accomplished by the VARISTOR in the AVC line.

Section V

VOLTAGE

TABLE

SET UP

The measurements given in the Voltage Chart opposite are accurate to $\pm 10\%$. They are based upon an input voltage of 115 VAC 60 cycles to a power supply capable of delivering -80 VDC at 10 MA., 12.6 VAC at 6 Amps, + 280 VDC at 130 MA. and + 750 VDC at 130 MA. Properly connected to the power receptacle (J1) on the rear of the VENUS. A VOM with a sensitivity of 20 K ohms per volt DC or better should be used. The control settings are as follows:

RECEIVE

1. SPEECH GAIN -- Switched clockwise and set to minimum.
2. CARRIER LEVEL -- Switched counter -clockwise to "0".
3. BALANCE CONTROL -- Set for best carrier balance in transmit.
4. RECEIVER RF GAIN -- FULL CLOCKWISE (V4 voltages vary with the control settings).
5. RECEIVER OFFSET -- At "0".
6. AVC to FAST.
7. DETECTOR --To AM DET
8. DETECTOR --To SSB-CW to measure V8 voltages only.
9. NOISE LIMITER --To "OFF".
10. AMPLIFIER PLATE -- Tune and Load controls set to any position.
11. RECEIVER AUDIO -- Switched clockwise, thus tuning the VENUS on.
12. VENUS main tuning dial to 50.2 MCS.

TRANSMIT

1. Tune up the transmitter section per previous instructions for SSB operation into a suitable load.
2. Switch the Speech Gain fully counter-clockwise to turn the transmitter on when making measurements.
3. Be sure Carrier Level is set to "0".

VENUS VOLTAGE TABLE

TUBE		1	2	3	4	5	6	7	8	9	10	11
V1	R	-	108	-	GND	-	-	-	.63	-	6.3Vac	
6CW4	T		0						0			
V2	R	4.3	0	NC	12.6Vac	6.3Vac	GND	190	82	4.3		
6EH7	T	0	-50					0	0	0		
V3	R	.64	-.1	NC	GND	6.3Vac	GND	192	25	.64		
6EH7	T	0	-.7					0	0	0		
V4	R	0	GND	GND	12.6Vac	192	87to195	1.5to27				
12BA6	T	-50				0	0	0to17				
V5	R	-1.5	1.2	12.6Vac	GND	183	100	0				
12BE6	T	-.5	0			0	0					
V6	R	-3.0	GND	GND	12.6Vac	182	95	1.7				
12BA6	T	-1.0				0	0	0				
V7	R	-.3	-1.3	GND	12.6Vac	GND	GND	-.6				
12AL5	T	.17	-.3					-.16				
V8	R	-.5	.8	GND	12.6Vac	135	38	-.02				
12BE6	T	-.6	0			0	0	-.02				
V9	R	65	-.3	.75	12.6Vac	GND	65	0	.765	NC		
12DW7	T	83	-.5	.85			0		0			
V10	R	NC	10	12.6Vac	GND	265	200	0				
12AQ5	T		0			305	230	-70				
V11	R	0	0	0	12.6Vac	GND	0	0	0	NC		
12DW7	T	160		7.15			160		1.49			
V12	R	3.3	156	0	6.3Vac	GND	140	147	25	25		
7360	T	4	152				142	150	27	26		
V13	R	-75	GND	12.6Vac	GND	0	0	0				
12AU6	T	-47				232	215	4				
V14	R	0	GND	12.6Vac	GND	0	0	17				
12AU6	T					230	195	2.75				
V15	R	0	-76	0	GND	12.6Vac	GND	0	GND	0to-5		
12BA7	T	80	-5	1.17						225		
V16	R	0	-37	GND	GND	12.6Vac	NC	285	285	GND		
12BY7	T	4.1	0					280	210			
V17	R	0	12.6Vac	0	0	NOTE 1	0	GND	GND			
6883	T			237								
V18	R	41	-1	GND	GND	6.3Vac	80	0	2.15	GND		
6DJ8	T											
V19	R	40	-6	GND	12.6Vac	12.6Vac	0	0	GND	6.3Vac		
12AU7	T	0	0				26	-4				
V20	R	150	GND	NC	NC	150	NC	NC				
OA2	T											
V21	R	85	-2.8	142	12.6Vac	6.3Vac	183	GND	GND	-6		
6U8A	T	85	-2.8	160			220			-6		
J1	R	0	0	-80	12.6Vac	GND	GND	0	NC	275	NC	800
	T											
J10	R	-6										
	T	230										
J13	R	0										
	T											

NOTE:

V17 PIN 5 - KEY DOWN -30V to -60V (R10)
 - KEY UP -70V

ITEM	DESCRIPTION	PART NO.
C1	CAPACITOR, VARIABLE, 8-50pf, N750	116-107
C2	CAPACITOR, VARIABLE, 5-25pf, NPO	116-108
C3	CAPACITOR, VARIABLE, 5-25pf, NPO	116-108
C4	CAPACITOR, VARIABLE, 2.3-14.2pf DIFFERENTIAL	110-015
C5	NOT USED	
C6	CAPACITOR, VARIABLE, 5-25pf, NPO	116-108
C7	CAPACITOR, VARIABLE, 15pf	110-003
C8	CAPACITOR, VARIABLE, 100pf	110-008
C9	CAPACITOR, VARIABLE, 1.8-8.7pf	110-004
C10	CAPACITOR, VARIABLE, 5-50pf	110-013
C11	CAPACITOR, ELECTROLYTIC, 4MFD, 500V	107-004
C12	CAPACITOR, ELECTROLYTIC, 40MFD @ 350V, 250MFD @ 25V	108-102
C13	CAPACITOR, ELECTROLYTIC, 10MFD, 15V	107-006
C14	CAPACITOR, ELECTROLYTIC, 10MFD, 15V	107-006
C15	CAPACITOR, DISC CERAMIC, 3.3pf, NPO, ± 0.25pf, 1KV	100-106
C16	CAPACITOR, DISC CERAMIC, 4.7pf, NPO, ± 0.25pf, 1KV	100-108
C17	CAPACITOR, DISC CERAMIC, 470pf, JF, ± 10%, 1KV	101-003
C18	CAPACITOR, DISC CERAMIC, 470pf, JF, ± 10%, 1KV	101-003
C19	CAPACITOR, DISC CERAMIC, 470pf, JF, ± 10%, 1KV	101-003
C20	CAPACITOR, DISC CERAMIC, 2.2pf, NPO, ± 0.25pf, 1KV	100-104
C21	CAPACITOR, DISC CERAMIC, 15pf, NPO, 5%, 1KV	100-114
C22	CAPACITOR, DISC CERAMIC, 3.3pf, NPO, ± 0.25pf, 1KV	100-106
C23	CAPACITOR, DISC CERAMIC, 470pf, JF, ± 10%, 1KV	101-003
C24	CAPACITOR, DISC CERAMIC, 2200pf +80-20%, 1KV	102-043
C25	CAPACITOR, DISC CERAMIC, 2200pf +80-20%, 1KV	102-043
C26	CAPACITOR, DISC CERAMIC, 1.0pf, NPO, ± 0.25pf, 1KV	100-100
C27	CAPACITOR, DISC CERAMIC, 12pf, NPO, ± 5%, 1KV	100-113
C28	CAPACITOR, DISC CERAMIC, 2.2pf, NPO, ± 0.25pf, 1KV	100-104
C29	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C30	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C31	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C32	CAPACITOR, DISC CERAMIC, 27pf, NPO, 5%, 1KV	100-117
C33	CAPACITOR, DISC CERAMIC, 22pf, NPO, 5%, 1KV	100-116
C34	CAPACITOR, DISC CERAMIC, 12pf, NPO, 5%, 1KV	100-113
C35	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C36	CAPACITOR, DISC CERAMIC, 33pf, NPO, 5%, 1KV	100-118
C37	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C38	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C39	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C40	CAPACITOR, DISC CERAMIC, 27pf, NPO, 5%, 1KV	100-117
C41	CAPACITOR, DISC CERAMIC, 27pf, NPO, 5%, 1KV	100-117
C42	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C43	CAPACITOR, DISC CERAMIC, 6.8pf, NPO, ± 0.25pf, 1KV	100-110
C44	CAPACITOR, DISC CERAMIC, 47pf, NPO, 5%, 1KV	100-120
C45	CAPACITOR, DISC CERAMIC, 56 pf, NPO, 5%, 1KV	100-121
C46	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C47	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C48	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C49	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C50	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C51	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C52	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C53	CAPACITOR, DISC CERAMIC, 150pf ± 10%, 1KV	101-000
C54	CAPACITOR, DISC CERAMIC, 150pf ± 10%, 1KV	101-000
C55	CAPACITOR, DISC CERAMIC, 3.3pf, NPO, ± 0.25pf, 1KV	100-106
C56	CAPACITOR, DISC CERAMIC, 12pf, NPO, 5%, 1KV	100-113
C57	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C58	CAPACITOR, DISC CERAMIC, 33pf, NPO, 5%, 1KV	100-118
C59	CAPACITOR, DISC CERAMIC, 150pf, ± 10%, 1KV	101-000
C60	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C61	CAPACITOR, DISC CERAMIC, 470pf, JF, ± 10%, 1KV	101-003
C62	CAPACITOR, DISC CERAMIC, 470pf, JF ± 10%, 1KV	101-003
C63	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C64	CAPACITOR, DISC CERAMIC, .001MFD, +80-20%, 1KV	102-039
C65	CAPACITOR, TUBULAR, MYLAR, .15MFD, ± 10%, 125V	105-305
C66	CAPACITOR, DISC CERAMIC, .005MFD, +80-20%, 1KV	102-050
C67	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C68	CAPACITOR, DISC CERAMIC, 2.2MFD, +80-20%, 3V	102-062
C69	CAPACITOR, DISC CERAMIC, 470pf, ± 10%, 1KV	101-003
C70	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C71	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C72	CAPACITOR, TUBULAR, MYLAR, .68MFD, 10%, 125V	105-307
C73	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C74	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C75	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C76	CAPACITOR, DISC CERAMIC, 47pf, NPO, 5%, 1KV	100-120
C77	CAPACITOR, DISC CERAMIC, 2.2MFD, ± 10%, 3V	102-062
C78	CAPACITOR, DISC CERAMIC, .001MFD, +80-20%, 1KV	102-039
C79	CAPACITOR, TUBULAR, MYLAR, .1MFD, 10%, 400V	105-304
C80	CAPACITOR, DISC CERAMIC, 47pf, NPO, 5%, 1KV	100-120
C81	CAPACITOR, TUBULAR, MYLAR, .047MFD, 10%, 400V	105-308
C82	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C83	CAPACITOR, TUBULAR, MYLAR, .1MFD, 10%, 400V	105-304
C84	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C85	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C86	CAPACITOR, DISC CERAMIC, 470pf, ± 10%, 1KV	101-003
C87	CAPACITOR, DIPPED SILVER MICA, 82pf, 5%, 500V	104-120
C88	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C89	CAPACITOR, DISC CERAMIC, 47pf, NPO, 5%, 1KV	100-120
C90	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C91	CAPACITOR, DISC CERAMIC, 56pf, NPO, 5%, 1KV	100-121
C92	CAPACITOR, DISC CERAMIC, 27pf, NPO, 5%, 1KV	100-117
C93	NOT USED	
C94	CAPACITOR, DISC CERAMIC, 33pf, NPO, ± 5%, 1KV	100-118
C95	CAPACITOR, SILVER MICA, 150pf, ± 1%, 500V	103-124
C96	CAPACITOR, SILVER MICA, 1300pf, ± 1%, 500V	103-110
C97	CAPACITOR, SILVER MICA, 1300pf, ± 1%, 500V	103-110
C98	CAPACITOR, DISC CERAMIC, 4.7pf, NPO, ± 0.25pf, 1KV	100-108
C99	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C100	CAPACITOR, TUBULAR, MYLAR, .33MFD, 125V, ± 10%	105-306
C101	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C102	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C103	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C104	CAPACITOR, DISC CERAMIC, 22pf, NPO, 5%, 1KV	100-116
C105	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C106	CAPACITOR, DIPPED MICA, 470pf, ± 5%, 500V	104-134
C107	CAPACITOR, DISC, CERAMIC, 12pf, NPO, 5%, 1KV	100-113

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ITEM	DESCRIPTION	PART NO.
C107	CAPACITOR, DISC CERAMIC, 12pf, NPO, 5%, 1KV	100-113
C108	CAPACITOR, DISC CERAMIC, 22pf, NPO, 5%, 1KV	100-116
C109	CAPACITOR, DISC CERAMIC, 0-1MFD, +80-20%, 25V	102-065
C110	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C111	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C112	CAPACITOR, DISC CERAMIC, .005MFD, +80-20%, 1KV	102-050
C113	CAPACITOR, DISC CERAMIC, 1.5pf, NPO, ±0.25pf, 1KV	100-102
C114	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C115	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C116	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C117	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C118	CAPACITOR, DISC CERAMIC, 3.3pf, NPO, ±0.25pf, 1KV	100-106
C119	CAPACITOR, DISC CERAMIC, 1.5pf, NPO, ±0.25pf, 1KV	100-102
C120	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C121	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C122	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C123	CAPACITOR, DISC CERAMIC, 10pf, NPO, ±5%, 1KV	100-112
C124	CAPACITOR, DISC CERAMIC, 56pf, NPO, 5%, 1KV	100-121
C125	CAPACITOR, DISC CERAMIC, 56pf, NPO, 5%, 1KV	100-121
C126	CAPACITOR, DISC CERAMIC, 6.8pf, NPO, ±5%, 1KV	100-110
C127	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C128	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C129	CAPACITOR, DISC CERAMIC, 15pf, NPO, 5%, 1KV	100-114
C130	CAPACITOR, DISC CERAMIC, 3.3pf, NPO, ±0.25pf, 1KV	100-106
C131	CAPACITOR, DISC CERAMIC, 2.2pf, ±0.25pf, 1KV, NPO	100-106
C132	CAPACITOR, TUBULAR, MYLAR, .68MFD, ±10%, 125V	105-307
C133	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C134	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C135	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C136	CAPACITOR, DISC CERAMIC, 470pf, +10%, 1KV	101-003
C137	CAPACITOR, DISC CERAMIC, 470pf, +10%, 1KV	101-003
C138	CAPACITOR, DISC CERAMIC, 47pf, NPO, 5%, 1KV	100-120
C139	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C140	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C141	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C142	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C143	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C144	CAPACITOR, DISC CERAMIC, 470pf, ±10%, 1KV	101-003
C145	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C146	CAPACITOR, DISC CERAMIC, 15pf, NPO, 5%, 1KV	100-114
C147	CAPACITOR, SILVER MICA, 470pf, ±20%, 2.5KV	103-108
C148	CAPACITOR, DIPPED SILVER MICA, 100pf, 5%, 2.5KV	104-130
C149	CAPACITOR, DIPPED SILVER MICA, 82pf, 5%, 2.5KV	104-140
C150	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C151	CAPACITOR, DISC CERAMIC, .01MFD, +80-20%, 500V	102-056
C152	CAPACITOR, DISC CERAMIC, .02MFD, +80-20%, 500V	102-056
C153	CAPACITOR, TUBULAR, MYLAR, .047MFD, ±10%, 400V	105-308
C154	CAPACITOR, TUBULAR, MYLAR, .68MFD, 125V	105-307
C155	CAPACITOR, DISC CERAMIC, 68pf, ±5%, 1KV, NPO	100-122
C156	CAPACITOR, DISC CERAMIC, .05MFD, ±10%, 1KV	102-059
C157	CAPACITOR, ELECTROLYTIC, 1.0MFD, 450V	107-002
C158	CAPACITOR, ELECTROLYTIC, 1.0MFD, 450V	107-002
C159	CAPACITOR, DISC CERAMIC, 2200pf, +80-20%, 1KV	102-043
C160	CAPACITOR, TUBULAR, MYLAR, .68MFD, ±10%, 125V	105-307
C161	CAPACITOR, DISC CERAMIC, .001MFD	102-039
C162	CAPACITOR, TUBULAR, POLYESTER, 1000PF, ±10%, 400V	105-300
C163	CAPACITOR, DISC CERAMIC, 1.5pf, NPO, ±0.25pf, 1KV	100-102
C164	CAPACITOR, DISC CERAMIC, 1.0pf, NPO, ±0.25pf, 1KV	100-100
C165	CAPACITOR, VARIABLE, 5-30pf, N750	116-114
C166	CAPACITOR, GIMMICK	
C167	CAPACITOR, DISC CERAMIC, .001MFD, +80-20%, 1KV	102-039
C168	CAPACITOR, DISC CERAMIC, .005MFD, +80-20%, 1KV	102-050
Y1	CRYSTAL, 18mc, HC-6/n CASE .093 PINS	250-014
Y2	CRYSTAL, 8549.5 mc, HC-6/n CASE .093 PINS	250-008
Y3	CRYSTAL, 899815 mc, HC-6/n CASE .093 PINS	250-009
Y4	CRYSTAL, 448.5KC, FT-241 CASE .093 PINS	259-003
FL1	CRYSTAL, 9mc CRYSTAL LATTICE FILTER	265-001
CR1	DIODE, SILICON T156	142-001
CR2	DIODE, SILICON T156	142-001
CR3	DIODE, GERMANIUM IN34A	141-001
CR4	DIODE, SILICON T156	142-001
CR5	DIODE, SILICON ED3001S	142-002
CR6	DIODE, SILICON VARICAP IN3182	145-001
CR7	DIODE, SILICON ED3001S	142-002
CR8	DIODE, SILICON SD-4	142-004
I1	LAMP INCANDESCENT, FROSTED #H1847	150-101
I2	LAMP INCANDESCENT, FROSTED #H1847	150-101
K1	RELAY, 12VDC, 4PDT	174-002
K2	RELAY, 12VDC, 4PDT	174-002
L1	INDUCTOR, 7 TURNS OF 191-007	195-306
L2	INDUCTOR, 1-2mh	182-004
L3	INDUCTOR, 1-2mh	182-004
L4	INDUCTOR, SLUG-TUNED	182-012
L5	INDUCTOR, SLUG-TUNED	182-012
L6	INDUCTOR, 1-2mh	182-004
L7	INDUCTOR, 40mh	182-013
L8	INDUCTOR, BALANCE ADJ	182-017
L9	INDUCTOR, 40mh	182-013
L10	INDUCTOR, SLUG-TUNED	182-012
L11	INDUCTOR, SLUG-TUNED .5-1mh	182-001
L12	INDUCTOR, SLUG-TUNED 6-78, 1-2mh	182-010

PARTS LIST

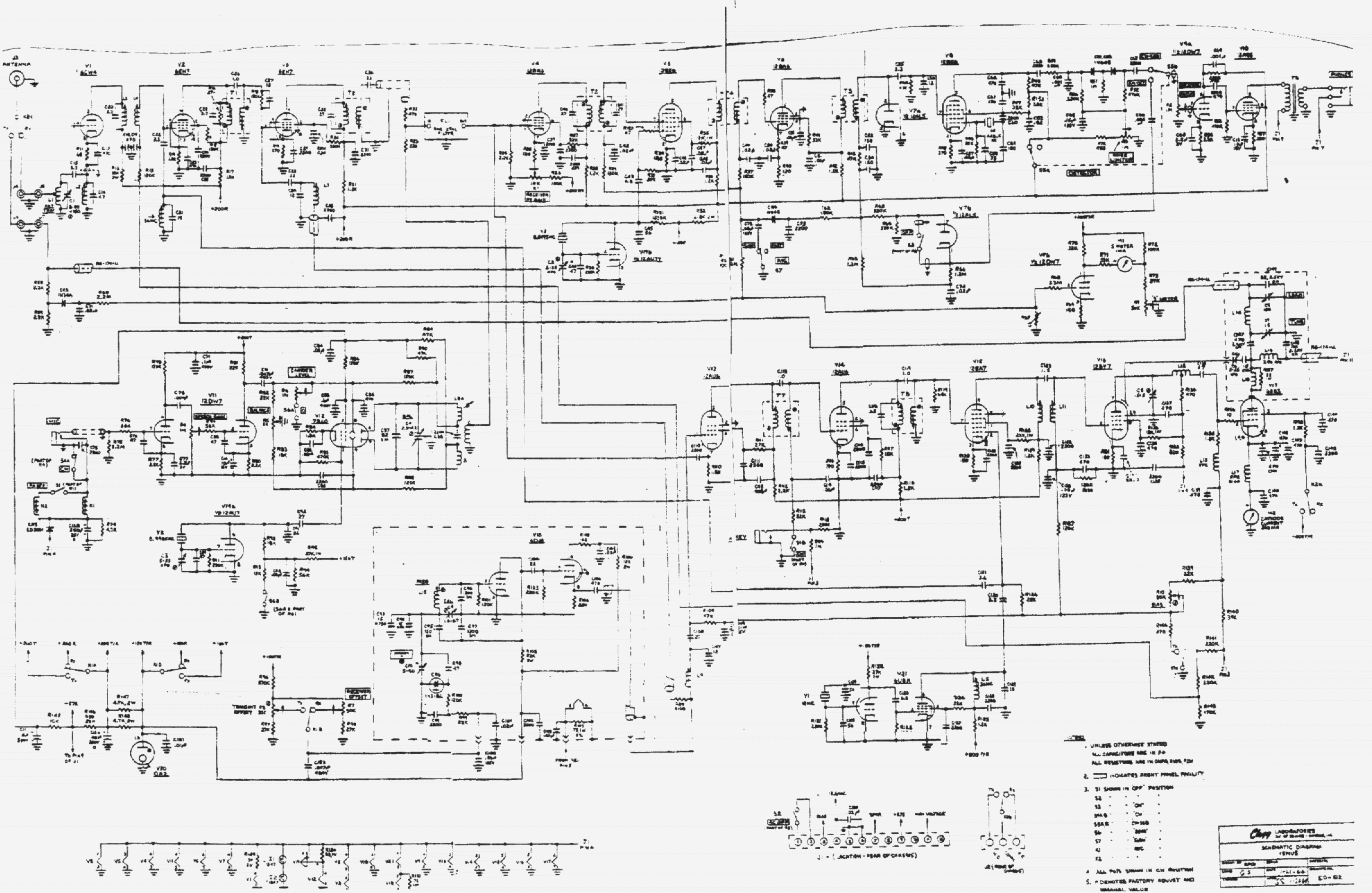
ITEM	DESCRIPTION	PART NO.
L13	INDUCTOR, RFC CHOKE	190-002
L14	INDUCTOR, 6 TURNS, #14 TINNED COPPER, 3/4" ID	191-053
L15	INDUCTOR, SLUG-TUNNED, 26 TURNS SOLENOID WOUND, #22 GAUGE	182-018
L16	INDUCTOR, RF CHOKE R50	190-004
L17	INDUCTOR, RF CHOKE R144	190-005
L18	+R137 = PARASITIC CHOKE, 1/2 TURN OF BRAID	
L19	INDUCTOR, RF CHOKE	190-002
M1	METER, 1MA, 5 METER	409-004
M2	METER, 200 MA, CATHODE CURRENT	409-005
P1	PLUG, P-10NC RCA TYPE SHORTING (CW INPUT)	805-013
P2	PLUG, ASSEMBLY + CIGZ (9MC. IF JUMPER)	805-007
R1	RESISTOR, VARIABLE 10K, 30%, 1/2 W	245-002
R2	RESISTOR, VARIABLE 1 MEG, 30%, 1/2 W	245-001
R3	RESISTOR, VARIABLE 1 MEG, 30%, 1/2 W	245-001
R4	RESISTOR, VARIABLE 1 MEG, 30%, 1/2 W	245-001
R5	RESISTOR, VARIABLE 5 K, 30%, 1/2 W	240-005
R6	RESISTOR, VARIABLE 1 MEG, 30%, 1/2 W	245-001
R7	RESISTOR, VARIABLE 50K, 30%, 1/2 W	240-006
R8	RESISTOR, VARIABLE 50K, 30%, 1/2 W	240-006
R9	RESISTOR, VARIABLE 50K, 30%, 1/2 W	240-006
R10	RESISTOR, VARIABLE 50K, 30%, 1/2 W	240-006
R11	RESISTOR, FIXED COMP, 68ohm, ±10%, 1/2 W	223-680
R12	RESISTOR, FIXED COMP, 10K, ±10%, 2 W	227-103
R13	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R14	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R15	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R16	RESISTOR, FIXED COMP, 27K, ±10%, 1/2 W	223-273
R17	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R18	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R19	RESISTOR, FIXED COMP, 270ohm, ±10%, 1/2 W	223-271
R20	RESISTOR, FIXED COMP, 330 K, ±10%, 1/2 W	223-334
R21	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R22	RESISTOR, FIXED COMP, 470 ohm, ±10%, 1/2 W	223-471
R23	RESISTOR, FIXED COMP, 220 ohm, ±10%, 1/2 W	223-221
R24	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R25	RESISTOR, FIXED COMP, 120ohm, ±10%, 1/2 W	223-121
R26	RESISTOR, FIXED COMP, 150K, ±10%, 1/2 W	223-154
R27	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R28	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R29	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R30	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R31	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R32	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R33	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R34	RESISTOR, FIXED COMP, 120ohm, ±10%, 1/2 W	223-121
R35	RESISTOR, FIXED COMP, 12K, ±10%, 1 W	225-123
R36	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R37	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R38	RESISTOR, FIXED COMP, 47 ohm, ±10%, 1/2 W	223-470
R39	RESISTOR, FIXED COMP, 47 ohm, ±10%, 1/2 W	223-470
R40	RESISTOR, FIXED COMP, 120 ohm, ±10%, 1/2 W	223-121
R41	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R42	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R43	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R44	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R45	RESISTOR, FIXED COMP, 270 ohm, ±10%, 1/2 W	223-271
R46	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R47	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R48	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R49	RESISTOR, FIXED COMP, 680K, ±10%, 1/2 W	223-684
R50	RESISTOR, FIXED COMP, 330K, ±10%, 1/2 W	223-334
R51	RESISTOR, FIXED COMP, 1 MEG, ±10%, 1/2 W	223-105
R52	RESISTOR, FIXED COMP, 470K, ±10%, 1/2 W	223-474
R53	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R54	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R55	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R56	RESISTOR, FIXED COMP, 470K, ±10%, 1/2 W	223-474
R57	RESISTOR, FIXED COMP, 330 ohm, ±10%, 1/2 W	223-331
R58	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R59	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R60	RESISTOR, FIXED COMP, 2.2MEG, ±10%, 1/2 W	223-225
R61	RESISTOR, FIXED COMP, 100K, ±10%, 1/2 W	223-104
R62	RESISTOR, FIXED COMP, 680K, ±10%, 1/2 W	223-684
R63	RESISTOR, FIXED COMP, 330K, ±10%, 1/2 W	223-334
R64	NOT USED	
R65	RESISTOR, FIXED COMP, 1.2MEG, ±10%, 1/2 W	223-125
R66	RESISTOR, FIXED COMP, 1.2MEG, ±10%, 1/2 W	223-125
R67	VARIATOR	249-002
R68	RESISTOR, FIXED COMP, 3.3Meg, ±10%, 1/2 W	223-335
R69	RESISTOR, FIXED COMP, 180 ohm, ±10%, 1/2 W	223-181
R70	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R71	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R72	RESISTOR, FIXED COMP, 100K, ±10%, 1/2 W	223-104
R73	RESISTOR, FIXED COMP, 39K, ±10%, 1/2 W	223-393
R74	RESISTOR, FIXED COMP, 4.7K, ±10%, 1/2 W	223-472
R75	RESISTOR, FIXED COMP, 2.2MEG, ±10%, 1/2 W	223-225
R76	RESISTOR, FIXED COMP, 56K, ±10%, 1/2 W	223-563
R77	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R78	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R79	RESISTOR, FIXED COMP, 56K, ±10%, 1/2 W	223-563
R80	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R81	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R82	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R83	RESISTOR, FIXED COMP, 18K, ±10%, 1/2 W	223-183
R84	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R85	RESISTOR, FIXED COMP, 470K, ±10%, 1/2 W	223-474
R86	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R87	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R88	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R89	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R90	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R91	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R92	RESISTOR, FIXED COMP, 18K, ±10%, 1/2 W	223-183

ITEM	DESCRIPTION	PART NO.
R93	RESISTOR, FIXED COMP, 12K, ±10%, 1/2 W	223-123
R94	RESISTOR, FIXED COMP, 56K, ±10%, 1/2 W	223-563
R95	RESISTOR, FIXED COMP, 27K, ±10%, 1W	225-273
R96	RESISTOR, FIXED COMP, 270K, ±10%, 1/2 W	223-274
R97	RESISTOR, FIXED COMP, 27K, ±10%, 1/2 W	223-273
R98	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R99	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R100	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R101	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R102	RESISTOR, FIXED COMP, 22K, ±10%, 2 W	227-223
R103	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R104	RESISTOR, FIXED COMP, 330ohm, ±10%, 1/2 W	223-331
R105	RESISTOR, FIXED COMP, 120 ohm ±10%, 1/2 W	223-121
R106	RESISTOR, FIXED COMP, 12K, ±10%, 1/2 W	227-123
R107	RESISTOR, FIXED COMP, 75 ohm ±5 %, 1 W	224-750
R108	RESISTOR, FIXED COMP, 820 ohm, ±10%, 1/2 W	223-821
R109	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R110	RESISTOR, FIXED COMP, 1.8K, ±10%, 1/2 W	223-182
R111	RESISTOR, FIXED COMP, 27K, ±10%, 1/2 W	223-273
R112	RESISTOR, FIXED COMP, 2.2K, ±10%, 1/2 W	223-222
R113	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R114	RESISTOR, FIXED COMP, 1 MEG, ±10%, 1/2 W	223-105
R115	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R116	RESISTOR, FIXED COMP, 330 ohm, ±10%, 1/2 W	223-331
R117	RESISTOR, FIXED COMP, 15K, ±10%, 1/2 W	223-153
R118	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R119	RESISTOR, FIXED COMP, 6.8K, ±10%, 1/2 W	223-682
R120	RESISTOR, FIXED COMP, 150 ohm, ±10%, 1/2 W	223-151
R121	RESISTOR, FIXED COMP, 220K, ±10%, 1/2 W	223-224
R122	RESISTOR, FIXED COMP, 27K, ±10%, 1W	225-273
R123	RESISTOR, FIXED COMP, 330K, ±10%, 1/2 W	223-334
R124	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R125	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R126	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R127	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R128	RESISTOR, FIXED COMP, 22K, ±10%, 1 W	225-223
R129	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R130	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R131	RESISTOR, FIXED COMP, 180 ohm, ±10%, 1/2 W	223-181
R132	RESISTOR, FIXED COMP, 18K, ±10%, 1 W	225-183
R133	RESISTOR, FIXED COMP, 820 ohm ±10%, 1/2 W	223-821
R134	NOT USED	
R135	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R136	RESISTOR, FIXED COMP, 10ohm, ±10%, 1/2 W	223-100
R137	RESISTOR, FIXED COMP, 22ohm, ±10%, 1 V	225-220
R138	RESISTOR, FIXED COMP, 1.2K, ±10%, 1/2 W	223-122
R139	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R140	RESISTOR, FIXED COMP, 39K, ±10%, 1/2 W	223-393
R141	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R142	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
R143	RESISTOR, FIXED COMP, 47K, ±10%, 1/2 W	223-473
R144	RESISTOR, FIXED COMP, 470 ohm, ±10%, 1/2 W	223-471
R145	RESISTOR, FIXED COMP, 10K, ±10%, 1/2 W	223-103
R146	RESISTOR, WIREWOUND, 900 ohm, 20 W	235-003
R147	RESISTOR, FIXED COMP, 4.7K, ±10%, 2 W	227-472
R148	RESISTOR, FIXED COMP, 4.7, ±10%, 2 W	227-472
R149	RESISTOR, FIXED COMP, 39 ohm, ±10%, 2 W	227-390
R150	RESISTOR, FIXED COMP, 82 ohm, ±10%, 1 W	225-820
R151	RESISTOR, FIXED COMP, 75 ohm, ±5%, 1 W	224-750
R152	RESISTOR, FIXED COMP, 47 ohm, ±10%, 1/2 W	223-470
R153	RESISTOR, FIXED COMP, 33K, ±10%, 1/2 W	223-333
R154	RESISTOR, FIXED COMP, 3.9ohm, ±10%, 1/2 W	223-039
R155	RESISTOR, FIXED COMP, 120K, ±10%, 1/2 W	223-124
R156	RESISTOR, FIXED COMP, 180K, ±10%, 1/2 W	223-184
R157	RESISTOR, FIXED COMP, 68K, ±10%, 1/2 W	223-683
R158	RESISTOR, FIXED COMP, 3.9K, ±10%, 1/2 W	223-392
R159	RESISTOR, FIXED COMP, 15K, ±10%, 1/2 W	223-153
R160	RESISTOR, FIXED COMP, 22K, ±10%, 1/2 W	223-223
S1	SWITCH, SPST (PART OF R1)	
S2	SWITCH, SPST (PART OF R2)	
S3	SWITCH, SPST (PART OF R3)	
S4	SWITCH, DPST (PART OF R4)	
S5	SWITCH, DPDT TOGGLE	283-001
S6	SWITCH, DPDT (PART OF R6)	
S7	SWITCH, SPST TOGGLE	283-003
T1	TRANSFORMER, 14mc IF	602-003
T2	TRANSFORMER, 10.7mc IF	602-002
T3	TRANSFORMER, 10.7mc IF	602-002
T4	TRANSFORMER, 456KC IF	602-001
T5	TRANSFORMER, 456KC IF	602-001
T6	TRANSFORMER, AUDIO OUTPUT	603-002
T7	TRANSFORMER, 14mc IF	602-003
T8	TRANSFORMER, 14mc IF	602-003
V1	ELECTRON TUBE 6CW4	216-020
V2	ELECTRON TUBE 6EH7	216-023
V3	ELECTRON TUBE 6EH7	216-023
V4	ELECTRON TUBE 12BA6	211-008
V5	ELECTRON TUBE 12BE6	211-009
V6	ELECTRON TUBE 12BA6	211-008
V7	ELECTRON TUBE 12AL5	211-001
V8	ELECTRON TUBE 12BE6	211-009
V9	ELECTRON TUBE 12DW7	211-007
V10	ELECTRON TUBE 12AQ5	211-010
V11	ELECTRON TUBE 12DW7	211-007
V12	ELECTRON TUBE 73o0	217-003
V13	ELECTRON TUBE 12AU6	211-012
V14	ELECTRON TUBE 12AU6	211-012
V15	ELECTRON TUBE 12BA7	211-004

ITEM	DESCRIPTION	PART NO.
V16	ELECTRON TUBE 12BY7	211-011
V17	ELECTRON TUBE 6883	216-028
V18	ELECTRON TUBE 6DJ8	216-021
V19	ELECTRON TUBE 12AU7A	211-002
V20	ELECTRON TUBE 0A2	210-001
V21	ELECTRON TUBE 6UBA	216-024

VENUS

600x40pc



- UNLESS OTHERWISE STATED
 ALL CAPACITORS ARE IN P.P.
 ALL RESISTORS ARE IN OHMS, UNLESS NOTED
- INDICATES FRONT PANEL PLACEMENT
1. S1 SHOWN IN "OFF" POSITION
2. S2 "ON" POSITION
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99. S99 "ON" POSITION
100. S100 "ON" POSITION

Cherry LABORATORIES			
SCHEMATIC DIAGRAM			
VENUS			
DATE	REV.	BY	CHK.
1958	1	J. H. B.	J. H. B.
1958	2	J. H. B.	J. H. B.
1958	3	J. H. B.	J. H. B.
1958	4	J. H. B.	J. H. B.
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1958	87	J. H. B.	J. H. B.
1958	88	J. H. B.	J. H. B.
1958	89	J. H. B.	J. H. B.
1958	90	J. H. B.	J. H. B.
1958	91	J. H. B.	J. H. B.
1958	92	J. H. B.	J. H. B.
1958	93	J. H. B.	J. H. B.
1958	94	J. H. B.	J. H. B.
1958	95	J. H. B.	J. H. B.
1958	96	J. H. B.	J. H. B.
1958	97	J. H. B.	J. H. B.
1958	98	J. H. B.	J. H. B.
1958	99	J. H. B.	J. H. B.
1958	100	J. H. B.	J. H. B.