VEGA

a **MARK IV** company

Signaling Products Group

Instruction Manual

Model C-534
Three-Line DC-Remote Control Console

09B-0333B

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Introduction

Vega's Model C-534 three-line DC-remote control console reliably controls two-way radio base stations at up to three different locations. The console is normally used in conjunction with functionally matching DC-control adapters, such as the Vega Model RA-230, located at the base stations. The C-534 console is also compatible with Motorola, GE, and other DC radio control systems.

The C-534 DC-control console is connected to remote base stations by means of three 600-ohm twisted-pair lines or by three leased telephone-company metallic lines. The connecting lines may be as short as 10 feet or as long as 90 miles (using low-loss lines).

Multiple DC consoles may be used on each line without seriously affecting performance. The parallel consoles may be C-534s or compatible single-line consoles such as the Vega Model C-530. Voice signals and clicks caused by line-current changes are audible at parallel consoles, thereby providing an audible indication of commands being generated elsewhere in the radio system.

The C-534 desk-type console includes a handset and loudspeaker, and uses solid-state switching (no relays) and jumper-plug current programming. Provisions have been made for a separate DC control line and earth-ground-return systems.

Operation

The C-534 DC-remote control consoles are designed for maximum ease of operation. Minimum operator familiarization is required. The following controls and indicators are included:

- *Volume Control:* Adjusts speaker audio level and, if desired, also the handset earpiece audio level.
- *Transmit PTT Switch:* Push to talk (generates transmit control current) and release to listen; located on the handset.
- *Transmit Lamp:* When on, indicates that console is transmitting (required by FCC rules).
- *Intercom:* When pressed, allows the operator to talk into the network (such as a parallel console or a technician at the remote base station) without keying the remote transmitter. The PTT switch is not pressed for this function.
- *Monitor:* When pressed, causes the base-station receiver with a subaudible-tone (CTCSS or continuous tone-coded squelch system) decoder to monitor all activity on the radio channel, by disabling the CTCSS decoder. This function minimizes the possibility of accidentally interfering with other cochannel users, and is required by FCC rules on multiple-user base stations.

  The monitor function may also be jumper-plug programmed to be activated when the handset is lifted off hook. The use of this off-hook monitor is not recommended for multiple-console systems because only one

current can flow through the line at one time. If one console in a parallel-console system is generating a continuous current, this current will add or subtract from the current generated by another console. This usually results in a wrong "command" to the base station.

- *Line Selection:* Operation of up to three separate lines to control three base stations is provided by means of a line-selection switch. Proper line-termination impedance is maintained on all lines regardless of line-selector-switch position. An all-line receive switch position is provided to allow monitoring of audio on all lines simultaneously. The PTT and intercom functions are inhibited in this switch position.

  In addition to the all-line receive feature, a preset adjustable "feedthrough" of unselected-line receive audio to selected-line receive audio is provided. This allows all-line monitoring without moving the selector switch from the primary line of interest.

- *Line-Activity Monitors:* LEDs provide identification of the active line(s). Line activity causes the associated LED indicator to light and remain lit for 8 to 12 seconds after the end of activity. This provides a temporary "memory" of line activity should the operator not notice which line the activity was on.

- *Speaker Disable:* The speaker is connected whenever the handset is on hook, and is disconnected whenever the handset is off hook. This allows hands-free listening for calls and telephone-style communications when initiating or answering a call. The speaker may also be made active when off hook by changing a jumper plug.

Typical Applications

The C-534 console can be used as a single unit or in parallel with other consoles on the same network, to control remote base-station radios. As shown in Figure 1, two consoles are connected to three leased telephone-company metallic lines feeding DC remote control adapters at the base stations. Either console can exercise full control over the remote base stations by use of the handset and switches.

All network activity, whether from a radio transmission or from a parallel console, can be monitored over either the speaker or the handset. Thus it is unlikely that one console operator would inadvertently interfere with any other console operator. One console operator can talk with another console operator switched to the same line, without keying the remote base transmitter, simply by pressing the intercom switch on the front panel.

The interconnections shown in Figure 1 are typical. Additional consoles may be connected to the common leased telephone line(s) to control the remote base station(s). (Custom Vega consoles are available for controlling other functions or status monitoring. Contact the Vega factory for assistance with your special system requirements.)

Installation

The C-534 DC-remote control console may be installed in any location convenient to the operator. Exposure to extreme dampness, temperature, and radio-frequency should be avoided for maximum life and reliability.

Base stations are often located at high elevations or other locations where lightning is a hazard. Above-ground DC lines also tend to attract lightning.

The C-534 line inputs are diode-protected from line transients up to a certain point, but protection from lightning-induced high-voltage/high-current transients on the DC lines has not been provided.

Vega will not repair or replace units during the warranty period which have obvious high-voltage damage such as vaporized PC-board traces or melted components.

If the DC lines are leased telephone-company metallic lines, lightning protection is almost always provided at the line entrance to the building. Customer-supplied above-ground lines should include lightning protection such as North Supply #561034 gas-discharge-tube devices located at the entrance to the building.

Additional protection such as North Supply #S-568015 gas-tube protectors may be installed inside the console.

The C-534 consoles are factory prepared for single console, +15 mA TX, –2.5 mA MON, and 0 mA RX. For other current programming, nontypical mic sensitivity requirements, audio attenuation nontypical of 4 to 12 miles of line, or multiple consoles, refer to "Disassembly" instructions.

Disassembly and Setup

WARNING: There is exposed 150 V_{dc} inside the console. Unplug the wall transformer before opening. This also prevents accidental shorts during disassembly.

Access to terminal strip, jumper plugs, and controls is obtained by loosening two screws on the bottom of the console and "folding" the case forward. This opens up the entire unit for setup.

Multiple Console Operation

For two or more parallel consoles, on all consoles change JP20 (line 1), JP17 (line 2), and JP11 (line 3) to B.

Off-Hook Speaker Operation

For off-hook speaker operation, change JP14 and JP15 to B (JP15B disables sidetone to eliminate the possibility of speaker-to-mic feedback).

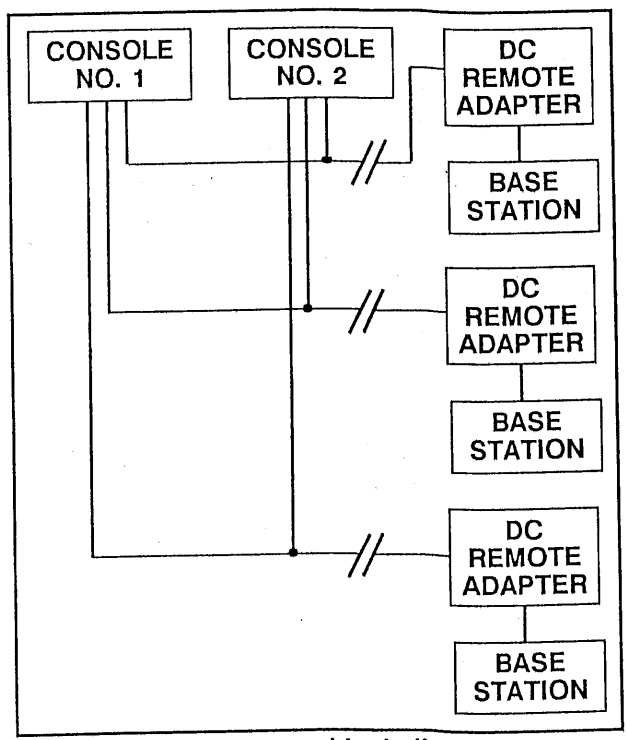

Figure 1. Overall system block diagram.

Off-Hook Monitor Operation

Change JP16 to B for automatic monitor when off hook. This is not recommended for multiple-console systems.

Level Adjustments

The console level controls are factory set to provide typically required mic and line input sensitivity and approximately 0 dBm line output for single-console operation.

Line-input-sensitivity controls R49 (line 1), R69 (line 2), and R70 (line 3) are set to drive the console about 6 dB into compression at –12 dBm line input. For proper adjustment of these controls, typical voice or a test tone from the base station should be used. Adjust these controls from minimum until the level at JP15B stops rising linearly, and turn the control slightly further clockwise. Do not adjust for a large amount of compression, because this will greatly increase line noises during voice pauses.

Line-output-level controls R96 (line 1), R97 (line 2), and R98 (line 3) controls as factory adjusted will drive a 600-ohm line at about 0 dBm, which is typically the maximum allowed by the telephone companies for a leased line. 0 dBm is also the recommended level for 600-ohm twisted-pair lines for distances up to 12 miles. These controls should always be adjusted when multiple consoles are used, since the output load may be less than 600 ohms. Adjust with all parallel consoles connected and powered. In single-console systems, the line output may be set with an output meter or an oscilloscope at JP20A (line 1), JP17A (line 2), or JP11A (line 3). Line output will be about the same as measured at the jumper plugs. For two or more consoles, JP20, JP17, and JP11 should be moved to "B". Line output will be about the same as measured at the jumper plugs for a two-console system. As additional consoles are added, line output will be about 3 dB below meter reading for every additional console. When line drive is about 0 dBm with multiple consoles, check for voice-peak clipping and reduce line drive if necessary.

Mic sensitivity control R10 should be set with normal voice input to the handset microphone while monitoring a selected line at JP20A, JP17A, or JP11A. Adjust R10 clockwise from minimum until the selected line output no longer increases at the rate proportional to R10 rotation. Do not adjust to maximum for normal voiced persons. Otherwise, unnecessary room-noise pickup would be produced, without increasing output.

Line-Current Programming

Refer to the schematic and to the PC-board screen. Determine the current and polarity required by the DC adapter at the base station for transmit and monitor functions. If PTT is other than +15 mA or monitor is other than –2.5 mA, move jumper plugs to the correct currents. No more than one jumper plug should be installed in any programming column because this causes unusual internal and/or external currents. In single-user systems, the monitor function may be left unprogrammed (no jumper plug in the monitor column).

Loop Resistance, Audio Attenuation, and Maximum Line Length

Allowing for low AC line voltage and the resistance increase of copper wire at high temperatures, the maximum loop resistance that should be used is 7600 ohms. Loop resistance is defined by Ohm's Law (R = V/I), and is measured at the console DC line terminals at the highest current to be used and with the adapter at the base station connected to the line, thus including the adapter voltage drop in the measurement.

When using a leased line, determine the resistance of the base-station adapter using R = V/I at the highest current to be used. Subtract this adapter resistance from 7600 ohms and specify this number to the telephone company as the maximum line resistance. Also specify audio signal loss from the console to a 600-ohm load at the base station to be 20 dB or less if only 0 dBm line drive is permitted, and to be 30 dB or less if +10 dBm line drive is permitted, assuming that the base station and the console can drive the line to +10 dBm. (Multiple consoles on a single line may not be able to drive a line at +10 dBm.) Sometimes leased metallic lines longer than 20 miles are not available.

When using a private two-wire DC line, first determine the base-station-adapter resistance using R = V/I at the highest current to be used and subtract this from 7600 ohms. This figure is the maximum resistance of the DC line. Select a wire gauge for the line (such as 24 gauge), obtain the 1000-ft 20°C resistance from wire tables for the gauge (25.67 ohms), and multiply by 2 because two wires are involved (51.34 ohms). Divide the maximum line resistance by this figure and obtain the maximum length in thousands of feet. Example: Adapter resistance is 1600 ohms, leaving 6000 ohms for line resistance. 6000 ohms divided by 51.34 equals 117 thousand feet for 24-gauge wire (22 miles).

Unfortunately, standard high-capacitance 24-gauge twisted-pair cable 22 miles long would result in about 40 dB of audio signal attenuation, which is unacceptable even with +14 dBm line drive. 19-gauge high-capacitance twisted-pair cable would have to be used for up to 16 miles at 0 dBm line drive and for up to 24 miles with +10 dBm line drive. Signal attenuation is therefore the line-length limiting factor when high-capacitance twisted-pair cable is used, because the maximum loop resistance of 19-gauge cable is not reached until about 70 miles. The consoles may be jumper-plugged for separate audio and DC lines, allowing the DC line to be used in conjunction with a microwave link for the audio signal.

The least expensive method for very long distances is the old-fashioned open-wire line. Using a pair of 12-gauge 40% copperclad steel conductors spaced 12 inches apart (1000 ohms impedance) for both audio signals and DC control will allow the line to be 87 miles in length at 0 dBm line drive. This distance could be further increased to 200 miles by using 6-gauge 40% copperclad steel (650 ohms impedance).

Open-wire line of 0.109-inch diameter #135 steel wire can also be used for up to 45 miles with 0 dBm line drive and up to 77 miles with +10 dBm line drive.

Multiple consoles on the DC line will decrease maximum line drive due to increased losses. +5 dBm line drive can still be obtained with up to eight consoles on a line. Receive losses are also increased from 3.5 dB for three consoles to 12 dB for eight consoles, thus requiring 3.5 to 12 dB less audio signal line loss or higher line drive from the base station.

Some DC control systems use earth ground as a common DC return between the console and base-station sites. This mode of operation has the advantage of

lower loop resistance for a given line (seldom needed) and the absence of DC-current-switching clicks. The disadvantage is the requirement of good earth grounds at the console and base-station sites (the use of the third-wire ground of the 120-V_{ac} wiring for ground return should not be used since this is dangerous and is seldom successful due to hum, ground-fault interrupters, etc.).

For ground-return operation of line 1, change JP21 to B, JP22 to B, and JP23 to A, and connect a good earth ground to TB1-5. The jumper plugs for lines 2 and 3 should be moved to line 1 positions for ground-return operation.

Cable

Generally, 24-gauge twisted-pair, 300-V, PVC-jacketed, high-capacitance cable is recommended for interior and other short-line-length usage. Cable splices should be made condensation-proof and weatherproof to prevent DC current leakage.

Theory of Operation

Audio Circuits

Referring to the schematic, sheets 1 and 2, the three line-drive/line-receive circuits are identical. When the selector switch is in the line 1 position, line receive audio is applied to compressor U9A through T3, R49, U10A, U13A, R77, U5B, U8C, and C17. When the selector switch is in the ALL position, the line 1 signal path from U10A is through R57, U5A, U3D, U5B, U8C, and C17. When the selector switch is in position 2 or 3, the line 1 RX signal path from U5A is through R9, U3C, R6, and U5B. SUM INS LVL control R6 adjusts compressor input level of unselected lines. When the selected line level is set to drive the compressor 10 dB into compression by R6, the speaker level will be about equal when only one of the lines is active. When both lines are active, however, the unselected line speaker level will drop about 10 dB due to action of the compressor.

During PTT with the selector switch in the line 1 position, TX audio from TX compressor U9B is applied to line driver U17A through C20, U8B, U10D, U18A, and R96. Line driver U17A,B is a current source bridge circuit which looks like a relatively high impedance to incoming RX signals. With JP20 in the A position (for a one-console system), transformer T3 looks like about 600 ohms to the line. With JP20 in the B position (two or more consoles), T3 looks like over 1200 ohms to the line.

Line-Activity-Monitor Circuits

The three line-activity-monitor circuits are identical. The receive audio from line 1 through T3, R49, U10A, and C33 is applied to U14B-6. At idle, U14-7,3,1 are high and line 1 LED LAM1 is off. When the line 1 audio signal peak exceeds the bias set at U14B-6 by R78 and R80, U14B-7 goes low, pulling U14A-3 low through CR9 and R73, energizing line 1 LED LAM1 and charging capacitor C41. A low is also applied to U14B-5 through C43. This positive feedback stretches short pulses into longer pulses.

When line 1 activity ends, C41 discharges through R74 for about 10 seconds until the voltage at U14A-3 exceeds the VR voltage at U14A-2. U14A-1 then goes high and LAM1 goes off.

DC-Line-Current Circuits

PTT switch operation, in addition to switching the audio circuits to TX, enables PTT logic output at U2D-11. This path is from the PTT switch on the handset through R22, U2A, and U6E to U2D-12. The monitor output at U2B-4 is enabled by the monitor switch through R33 to U2B-6. Monitor logic output is disabled at U2B-6 by PTT from U2A-3 through CR3. The ALL switch position disables PTT at U2A-1 and monitor at U2B-5. IC (intercom) enables TX through U6B, R22, and U2A and disables PTT logic at U2D-13.

Assuming that current programming jumper plugs JP1 and JP5 are as shown on the schematic, a high at the PTT logic output at U20-11 enables analog gate U1A, which then conducts a precise 4.4 volts from JP5 to R on sheet 2 through U13B when the line-selector switch is in position 1, to U21C-10. Feedback from U21C-8 through the base-emitter junction of Q1 maintains 4.4 volts across the 274-ohm resistor R106, which causes 16 mA of Q1 emitter current. After subtracting Q1 base current from Q1 emitter current, about 15.4 mA will flow through the collector of Q1 from one side of the DC line at TB1-3 through half of the secondary winding of T3, JP23A, and CR16.

Q17 is forward-biased to saturation by about 5.1 V_{dc} at U21C-8 through R90. Q17 collector current forward biases Q13 to saturation through R122 and effectively connects the +150 V_{dc} to the other side of the DC line through Q13, CR23, JP22, and half the secondary of T3 to TB1-6.

The approximately 15.4 mA line current is maintained regardless of line loop resistance by the constant voltage across R106. The collector voltage of Q1 will vary to maintain the 15.4 mA current up to the point of Q1 saturation caused by high loop resistance. Also, due to the constant-current circuit used, power-supply ripple current through the line is effectively blocked.

When a negative 2.5 mA is programmed for monitor per the schematic, U21B-5 receives a precise 0.73 V from the voltage divider through U3B, S, and U18C, causing Q2 to sink 2.5 mA from the line at TB1-6. Q16 and Q18 are forward-biased in the same manner as with positive current programming, and the positive 150 V flows through Q16, CR24, -C1, and half of the secondary of T3 to TB1-3.

Technical Assistance

Vega products are engineered to meet your requirements of performance, reliability, and compatibility. Technical assistance is offered by correspondence or telephone, should it be required, to assure your satisfaction.

Warranty (Limited)

All Vega signaling products are guaranteed against malfunction due to defects in materials and workmanship for three years, beginning at the date of original purchase. If such a malfunction occurs, the product will be repaired or replaced (at our option) without charge during the three-year period, if delivered to the Vega factory. Warranty does not extend to damage due to improper repairs, finish or appearance items, or malfunction due to abuse or operation under other than the specified conditions, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential

damages, so the above limitation may not apply to you. This warranty gives the customer specific legal rights, and there may be other rights which vary from state to state.

Claims

No liability will be accepted for damages directly or indirectly arising from the use of our materials or from any other causes. Our liability shall be expressly limited to replacement or repair of defective materials.

Model C-534 Specifications

Each Line Input and Output Impedance: 600 Ω nominal or 1200 Ω nominal, jumper-plug selectable, transformer isolated

Each Line Audio Input Level: –25 dBm to +15 dBm

Each Line Audio Output Level: –25 dBm to +13 dBm (with reference to noncompressed peak-to-peak measurements) into a 600-Ω line; to +11 dBm, in a three-console system, to +5 dBm in an eight-console system

Each Line: Two-wire, four-wire (two-wire TX/RX, two-wire DC) or two-wire earth-ground return

Audio Compression (Receive and Transmit): Less than 3 dB change in output for 30 dB change in input above threshold

Distortion: 2% maximum at 30 dB compression

Hum and Noise: 50 dB below operating levels, minimum

Speaker: 4 in, 8 Ω, heavy-duty, high efficiency

Amplifier Power: 800 mW into 8 Ω at 10% THD

Handset Earpiece Level: Adjustable preset level independent of speaker volume control or dependent upon speaker volume control, jumper-plug selectable

Sidetone Level: About 25 dB below receive level, jumper-plug selectable

Audio Frequency Response: ±1.5 dB, 300-3000 Hz

DC Line Control Voltage: 150 V_{dc}, nominal

Operating-Temperature Range: 0 to +50°C

Power Requirements: 120 V_{ac}, 60 Hz, 15 VA maximum

DC Line Control Current:

RX: 0 mA

TX and MON: 0 mA (off), ±2.5, 5, 6, 9, or 15 mA, jumper-plug selectable

Line Selector: Four-position rotary switch—three positions for line selection and one for all-line receive

Line-Activity Monitors: LED type with fixed –20 dBm sensitivity and 8 to 12 second off-delay

Unselected Line Feedthrough: Adjustable from off to selected line level

C-534 Parts List

Part No.	Description	Ckt Sym
010-0577	**C-534 3-LINE DC CONSOLE**	
011-0088	TOP ASSY C-534	
012-0043	XFMR ASSY C-534 POWER	
011-0088	**TOP ASSY C-534**	
012-0007	SUB ASSY PHONE BASE	
012-0041	PCB ASSY C-534 MAIN PCB	
021-6607	SPEAKER C-516 CONSOLE	
024-0016	PANEL FRNT C-534	
065-0417	PCB C-534 SW UPPER	
065-0418	PCB C-534 SW LOWER	
130-0753	RES VAR 10K LOG PNL	R201
138-0056	RNET CMM 5X1K SIP	RN201
161-0573	DIODE LED T1 3/4 RED DIF	DS201
161-0604	LED RED T1 SUPER BRT	DS202
		DS203
		DS204
249-0121	HANDSET ELECTRET PTT	
286-1881	CONNECTOR 20 PIN IDC	
286-1884	PIN STRIP SPACER 16X1/4"	P201
		P202
286-1885	RECPT SIP 8POS	J201
		J202
286-1905	HEADER 20P VERTLOC EJECT	P203
295-0510	SW ROTARY 1P 4POS PC MNT	S203
296-0588	SWITCH PCB PUSH MOM W/LED	S201
		S202
517-0183	WASH FLAT NYLON3/8ODX5132	
517-0206	WASHER FLAT .093IDX1/4 OD	
528-0022	SCREW PH 6-32 X 1/4	
528-0264	SCREW PH 3-28X5/8 TYPE B	
530-0003	SCREW TRHD4-40X1/4 STL	
536-0358	NUT TINNERMAN .187ID PERM	
550-0260	KNOB CONT R-31A HP VOL	
561-0657	SPACER NYL .2L FOR T1 LED	
561-0660	SWAGE SPACER #4X1/4	
674-0246	CABLE RBN 20 CON	
850-0332	LABEL ID DC CONSLE	
869-0024	CASE TELEPHONE BEIGE	
012-0007	**SUB ASSY PHONE BASE**	
523-0081	RIVET 1/8 X 1/4 POP	
523-0107	RIVET FOOT ATTACHING	
531-0272	SCREW CABINET LOCK CA	
012-0041	**PCB ASSY C-534 MAIN PCB**	
021-6634	HEAT SINK C-534	
065-0416	PCB C-534 MAIN	
071-0536	SCHEMATIC C-534	
102-0390	CAP CER 270P S2L 5% 50V	C7
		C19
		C22
		C30
105-1102	CAP MYLAR .0047MF 10% 100	C29
105-1121	CAP MYLAR 2.2UF 10% 250V	C5
		C26
		C38
110-1249	CAP CER .001MF 20% 1KV	C25
		C37
		C4
		C52
110-1340	CAP CER .1MF SMALL	C6
		C8
		C10
		C13
		C18
		C28
		C32
		C33
		C34
		C35

		C36
		C42
		C43
		C53
		C54
		C55
112-1606	CAP ELEC 10MF 25V	C9
		C23
		C39
112-1608	CAP ELEC 1.0MF 20% 25V	C11
		C12
		C14
		C16
		C17
		C21
		C24
		C27
112-1673	CAP ELEC 2.2MF 20% RAD	C3
112-1676	CAP ELEC 100UF 16V	C15
		C31
		C41
		C44
		C51
112-1678	CAP ELEC 1.0UF 50V NP	C2
		C20
112-1707	CAP ELEC 22UF 250V	C46
112-1708	CAP ELEC 47UF 160V	C47
112-1709	CAP ELEC 100UF 100V	C48
112-1710	CAP ELEC 220UF 100V	C49
112-1711	CAP ELEC 470UF 35V	C40
		C45
		C50
130-0526	RES VAR 100K VER MT LIN	R10
130-0532	RES VAR 10K VER MT LIN	R49
		R6
		R69
		R70
		R96
		R97
		R98
130-0725	RES VAR 10K LOG PC HADJ	R11
134-0212	RES RN55D 10.0K 1% 1/4W	R51
		R59
		R62
		R65
		R67
		R72
		R79
		R80
		R81
		R82
		R83
		R85
		R86
		R100
		R103
134-0311	RES RN55D 16.5K 1% 1/4W	R60
		R63
		R66
134-2886	RES RN55D 332 1% 1/4W	R4
134-3036	RES RN55D 274 1% 1/4W	R1
		R5
		R88
		R89
		R106
		R107
		R110
		R111
134-3057	RES RN55D 2.87K 1% 1/4W	R3
134-3059	RES RN55D 665. 1% 1/4W	R2
134-3065	RES RN55D 681.K 1% 1/4W	R52
		R78
		R99
134-3087	RES RN55D 110. 1% 1/4W	R125
		R95

136-0002	RES COMP 4.7 5% 1/4W	R35
136-0012	RES COMP 22 5% 1/4W	R84
136-0026	RES COMP 330 5% 1/4W	R17
136-0028	RES COMP 470 5% 1/4W	R54
		R56
		R71
		R73
		R102
		R105
136-0030	RES COMP 680 5% 1/4W	R18
136-0032	RES COMP 1K 5% 1/4W	R12
		R13
		R93
136-0033	RES COMP 1.2K 5% 1/4W	R31
		R47
		R68
136-0040	RES COMP 4.7K 5% 1/4W	R21
		R23
		R26
		R46
136-0044	RES COMP 10K 5% 1/4W	R39
		R90
		R91
		R92
		R108
		R109
		R112
		R115
		R116
		R117
		R120
		R121
		R124
136-0046	RES COMP 15K 5% 1/4W	R36
		R9
136-0048	RES COMP 22K 5% 1/4W	R101
		R20
		R25
		R30
		R32
		R34
		R37
		R42
		R44
		R50
		R53
		R57
		R75
		R76
		R77
136-0052	RES COMP 47K 5% 1/4W	R43
		R45
136-0054	RES COMP 68K 5% 1/4W	R113
		R114
		R118
		R119
		R122
		R123
136-0056	RES COMP 100K 5% 1/4W	R16
		R22
		R33
136-0057	RES COMP 120K 5% 1/4W	R104
		R55
		R74
136-0058	RES COMP 150K 5% 1/4W	R87
136-0060	RES COMP 220K 5% 1/4W	R126
		R15
136-0064	RES COMP 470K 5% 1/4W	R41
136-0068	RES COMP 1M 5% 1/4W	R24
		R28
136-0095	RES COMP 7.5K 5% 1/4W	R19
		R27
136-0096	RES COMP 2K 5% 1/4W	R48
136-0262	RES COMP 91 5% 1/4W	R58
		R61

REVISIONS				
SYM.	CHGNO	DESCRIPTION	APP.	DATE
A	90-167	RELEASE TO PRODUCTION	M.R.	7/24/90
B	93-	ADDED HOOKS FOR C-535 CONSOLE		

HOOK SWITCH
BLK. J4
RED. J3
ON HOOK
BRN. J2
YEL. J5
JP14 A B
C15 100 16V
+12V
C28 .1
U7 LM386
R48 2K
C30 270P
R35 4.7
C13 .1
R18 680
VOLUME CONTROL
10K LOG.
LOCATED ON UPPER SW PCB
R201
P1-20
P1-19
P1-18
JP6 B A
R17 330
C3 2.2 25V
R16 100K
R14 5.1K
U4B NE5532
VR
EAR VOLUME
R11 10K LOG
C27 1 25V
C29 .0047
R36 15K
U8A 4066
R40 620K
JP15 A B
SIDETONE
E15 RX OUT
SJ1
U8C 4066
R42 22K
C17 1 25V
R41 470K
C18 .1
C24 1 25V
RN3B 22K
RN3D 22K
RN3C 22K
RN3A 22K
U9A NE570
C14 1 25V
C21 1 25V
C22 270P
C23 10 25V
R43 47K
R25 22K
EAR
PTT
MIC
HANDSET
J1-4
J1-3
J1-1
J1-2
R13 1K
R15 220K
C2 1
C7 270P
MIC. SENS.
R10 100K
R12 1K
U4A NE5532
C1 1
R7 1K
E1 MIC. AMP IN
R8 220K
U8D 4066
R30 22K
C12 1 25V
CR2 1N4148
R29 36K
R37 22K
C8 .1
C10 .1
C11 1 25V
RN2B 22K
RN2D 22K
U9B NE570
RN2C 22K
RN2A 22K
C16 1 25V
C19 270P
R45 47K
C9 10 25V
R28 1M
E16 TX OUT
R44 22K
U8B 4066
R39 10K
R38 20K
U10D TL084
TXOUT
E9 E10 E11 E12
DESK MIC ADAPTOR PCB D65-0453
PTT
MIC
MON
MIC PREAMP
DESKMIC
J1-4
J1-2
J1-5
J1-1
J1-6
J1-3
JP1 B A
JP2 B A
R2 2.2K
R3 270
R4 220K
E17 FROM AUX MIC
E15
E16 TO MIC AMP IN
E18 FROM AUX DYN MIC
R5 10K
C1 100 16V
R1 2.2K
E1 E2 E3 E4 E5 GND
+12V E6 E7 E8
E13 E14 MON
TX
RX
ALL
PTTNOT
R20 22K
R27 7.5K
SUM
U3D 4066
U5A TL072
R9 15K
U5B TL072
R19 7.5K
R6 10K
SUM MS. LVL.
U3C 4066
RXIN
VR
U2A 4001
U6E 2004
R23 4.7K
R22 100K
R24 1M
C6 .1
R26 4.7K
E13 +12V
R3 2.87K
R2 665
15mA
9mA
JP5
U1A 4066
R
S
JP2 +9/15mA
JP1
-9/15mA
JP24
RN1A 22K
R4 332
U1B 4066
RN1B 22K
+6
+5 mA
R125 110 1%
U1C 4066
JP3
JP4
+6mA
-6mA
RN1C 22K
R1 274
U1D 4066
RN1D 22K
U3A 4066
JP9
JP10 +2.5mA
-2.5mA
PTT
MON
RN1E 22K
U3B 4066
RN1G 22K
R5 274
TO RS PCB +12V
UPPER SWITCH PCB 065-0454
P1-3
P1-4
P1-5
P1-6
P1-7
P1-8
P1-9
P1-10
20P IDC TO RS PCB
RN201 1K
DS201 TX.
E201
E202
IC.
MON.
S201
S202
E203
U6C 2004
U6D 2004
U6A 2004
U6B 2004
E14 PTT
U2C 4001
U2D 4001
R126 220K
C55 .1
CR3 1N4148
R46 4.7K
R33 100K
U2B 4001
MON
CR1 1N4148
R21 4.7K
SPKR. 8OHM
E205
E204
P1-2
P1-1
20P IDC TO RS PCB
E2 MON
JP16 B A
OFF HOOK MONITOR
160VDC
TPHV
R95 110 1%
R87 150K
C46 22 250V
CR10 1N4003
CR6 1N4003
CR5 1N4003
C47 47 160V
C48 100 100V
C49 220 100V
CR11 1N4003
CR7 1N4003
C50 470 35V
24VAC
TB1-1
TB1-2
VR
TPVR
TP+12
+12V
R93 1K
C51 100 16V
R94 1.1K
C39 10 25V
U12 LM7812
C40 470 35V
CR8 1N5335B 3.9V/5W
CR25 1N5335B 3.9V/5W
TPGND
C52 .001 1KV
E12 GND

NOTES: (UNLESS OTHERWISE SPECIFIED)
1) ALL JUMPER PLUGS ARE PLACED AS INDICATED BY:
2) RESISTORS ARE 1/4W 5%.
3) CAPACITORS ARE 20%.
4) E12-18 WERE ADDED FOR C-535 DESK MIC.

LAST USED	NOT USED	DRAWN	D.R. McAFEE 2/8/90
		CHECK	
		ENGR.	
		APP.	

MODEL	NEXT ASSY.
534/535	012-0082

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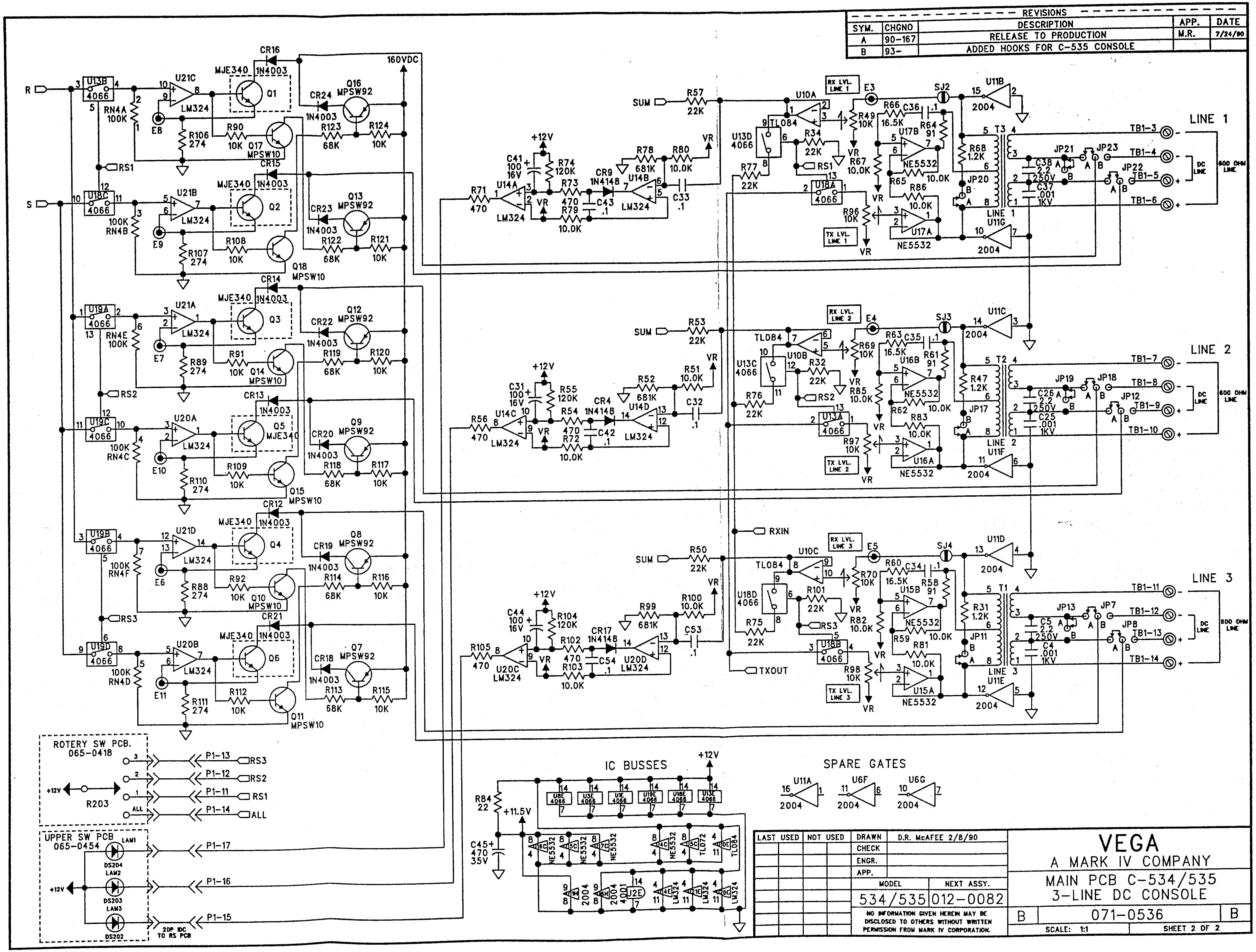
VEGA
A MARK IV COMPANY

MAIN PCB C-534/535
3-LINE DC CONSOLE

B	071-0536	B

SCALE: 1:1 SHEET 1 OF 2


REVISIONS
SYM. | CHGNO | DESCRIPTION | APP. | DATE
A | 90-167 | RELEASE TO PRODUCTION | M.R. | 7/24/90
B | 93- | ADDED HOOKS FOR C-535 CONSOLE
160VDC
SUM
LINE 1
LINE 2
LINE 3
600 OHM LINE
DC LINE
RX LVL. LINE 1
TX LVL. LINE 1
RX LVL. LINE 2
TX LVL. LINE 2
RX LVL. LINE 3
TX LVL. LINE 3
RXIN
TXOUT
ROTARY SW PCB. 065-0418
UPPER SW PCB 065-0454
20P IDC TO RS PCB
IC BUSSES
SPARE GATES
LAST USED | NOT USED | DRAWN D.R. McAFEE 2/8/90
CHECK
ENGR.
APP.
MODEL 534/535
NEXT ASSY. 012-0082
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VEGA
A MARK IV COMPANY
MAIN PCB C-534/535
3-LINE DC CONSOLE
B 071-0536 B
SCALE: 1:1
SHEET 2 OF 2