ERICSSON

Mobile Communications

DELTA STATION
CLOCK/VU METER OPTION
19A704666G1

Maintenance Manual

PARTS LIST

DELTA STATION
CLOCK/VU METER OPTION
(Q222000)

(8808R 3

SYMBOL	GE PART NO.	DESCRIPTION
		WHEN ORDERING REPLACEMENT PARTS ALL PART NUMBERS SHOULD BE PRECEDED BY: 019/
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	Q221701	.22 uF, sim to: Panasonic ECDE21Z24KZ
C2	Q221702	.001 uF, sim to: Panasonic ECKF2H102MBR
C3	Q221701	.22 uF, sim to: Panasonic ECDE21Z24KZ
C4	Q221703	.47 uF, sim to: Panasonic ECSF1VF474
C5	Q221702	.001 uF, sim to: Panasonic ECKF2H102MBR
C6	Q221704a	Sim to: Sprague CAP TG810
C7	Q221705	Electrolytic, 100 uF; sim to: Panasonic ECE-D1AV101S
C8	Q221707	.1 uF, sim to: Panasonic ECQR1104KZ
C9	Q221705	Electrolytic, 100 uF; sim to: Panasonic ECE-E1EV101S
C10	Q221706	Tantalum, 10 uF; sim to: Panasonic ECSF1CE106K
C11	Q221707	Sim to: TYSONIX CAP 81110A100-C0G0-33J
C12	Q221709	Sim to: Johanson Trimmer CAP 9613 S1.
C13	Q221706	Tantalum, 10 uF; sim to: Panasonic ECSF1CE106K
C14	Q221705	Electrolytic, 100 uF; sim to: Panasonic ECE-E1EV101S
		- - - - - - - - - - DIODES - - - - - - - - - -
D1 thru D5	Q221203	Diode 1N4148
D6	Q221202	Sim to: Motorola Diode 1N5230B
D7	Q221203	Diode 1N4148
D8	Q221201	Diode 1N5226B
D9	Q221203	Diode 1N4148
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1	Q224301	Sim to: Molex 4030-22-03-2041
J2	Q222702	Sim to: Molex 4030-22-03-2031
		- - - - - - - - - - PLUGS - - - - - - - - - -
P2	Q224101	Socket; sim to: Molex 7859-15-38-1024
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	Q221102	2N5210
Q2	Q221101	MPS 3904
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	Q221302	47K ±10%, 1/4 w.
R2	Q221301	150K ±10%, 1/4 w.
R3	Q221303	220K ±10%, 1/4 w.
R4 and R5	Q221304	100K ±10%, 1/4 w.
R6	Q221303	220K ±10%, 1/4 w.
R7	Q221304	100K ±10%, 1/4 w.
R8	Q221305	1K ±10%, 1/4 w.
R9 and R10	Q221306	10K ±10%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	GE PART NO.	DESCRIPTION
R11	Q221315	EC226F, 100 ohms, 1w.
R12	Q221307	1.2K ±10%, 1/4 w.
R13	Q221305	1K ±10%, 1/4 w.
R14	Q221308	6.8K ±10%, 1/4 w.
R15	Q221309	2.2K ±10%, 1/4 w.
R16	Q221310	1 megohm ±10%, 1/4 w.
R17	Q221313	20 ohms, 5 w; sim to: TRW PW5-20
R18	Q221317	820 ohms ±10%, 1/4 w.
R19	Q221316	8.2K ±10%, 1/4 w.
R20 and R21	Q221311	3.3K ±10%, 1/4 w.
R22	Q221312	100 ohms ±10%, 1/4 w.
R23	Q221314	8.2 ohms, 5 w.; sim to: TRW PW5
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1 thru S3	Q221501	Sim to: ITT SCHADOW; 210091
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1	Q221401	LM324
U2	Q221002	Sim to: National NSM39169
U3	Q221402	LM555
U4	Q221001	Sim to: National MA1136YZW
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y1	Q221801	3.579545 MHz
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	Q224303	16 pin connector; sim to: AMP 1640098-6
	Q224304	12 pin connector; sim to: AMP 640098-2
	Q224305	3 pin connector; sim to: AMP 640098-3 (Quantity 2)
	19B800617P2	Tuning Tool
		CABLE ASSEMBLY Q339901
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	Q324101	Socket; sim to: Molex 2695-22-01-2047. (Quantity 2).
P14	Q324102	Pin connector; sim to: Molex 08-50-0114. (Quantity 7).
		- - - - - - - - - - WIRES - - - - - - - - - -
W1	Q321902	Sim to: ALPHA 22AWG1855 Red
W2	Q321903	Sim to: ALPHA 22AWG1855 Black
W3	Q321904	Sim to: ALPHA 22AWG1855 Orange
W4	Q321901	Sim to: ALPHA 22AWG1855 Lt. Blue

ERICSSON

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TYPICAL SPECIFICATIONS

INPUT VOLTAGE	+13.8 VDC
CURRENT DRAIN:	
Clock	180 Ma
Clock and VU	220 Ma
TEMPERATURE RANGE	0 to +60°C
DISPLAY COLOR:	
Clock	Yellow LED
VU	7 Green/3 Red LED
DISPLAY TYPE:	
Clock	Four digit 7 segment .03" LED
	Displays hours and minutes 12/24 hour operation
	Flashing seconds colon
	PM indicator for 12 hour operation
VU Meter	Ten bar LED bar graph

DESCRIPTION

The General Electric electronic digital clock/VU meter option is designed to operate with the Delta desk top station to provide a real time of day clock function, and an audio transmit VU meter function. The option consists of a completely assembled board featuring a four digit display, ten element bar graph display and all supporting circuitry. The option board interconnects to the Delta desk top station system board via a single cable assembly. The cable couples J1 of the option board to J14 of the station system board.

Power is supplied to the board on J1 pin 1 and ground on J1 pin 2. Negative supply converter U3, D3 and D4 provide a negative voltage for integrated circuit U1.

CIRCUIT ANALYSIS

DIGITAL ELECTRONIC CLOCK

The clock portion of the option board displays either 12 hour or 24 hour readout. Selecting the mode of operation is accomplished by moving the jumper on J2. Plug P2 should be on pins 2 and 3 for 12 hour operation and on pins 1 and 2 for 24 hour operation. The clock operates whenever power is applied to the station, and flashes to indicate a power interruption.

The readout consists of four digit positions, each composed of a seven segment LED display. A flashing seconds colon is also displayed along with a PM indicator for the 12 hour clock function. Two time setting switches are provided on the clock: FAST SET (S1) and SLOW SET (S3). A SET ALLOW (S2) switch is also provided and should be depressed in conjunction with S1 or S3. This allows the time displayed to be changed.

The FAST SET switch (S1) allows setting of the time at a rapid rate. The SLOW SET switch (S3) sets the time at a slower rate. It is used as a "fine tune" when setting the time displayed.

The clock frequency is controlled by crystal Y1 and associated circuitry consisting of C11, C12, and R16. Voltage divider network R19, R20, and R21 control the intensity of the seven segment displays. Removing R21 increases the intensity.

The circuitry consisting of Q2, R17, R18, C13, and D8 supply sufficient current to integrated circuit U4 to drive the seven segment displays. Resistor R17 is a dropping resistor which provides the correct bias for Q2. It can be mounted on the station chassis, with connection points being pins 5 and 6 on J1, if necessary for heat dissipation purposes.

The circuit consisting of D6, D7, C14, and R22 is used to regulate voltage supplied to U4. The voltage is held constant at 9 volts by zener diode D6.

Regulated 9 volts is supplied to pin 18 of U4 and also to pin 2 except when plug P2 is positioned for 24 hour clock operation.

VU METER

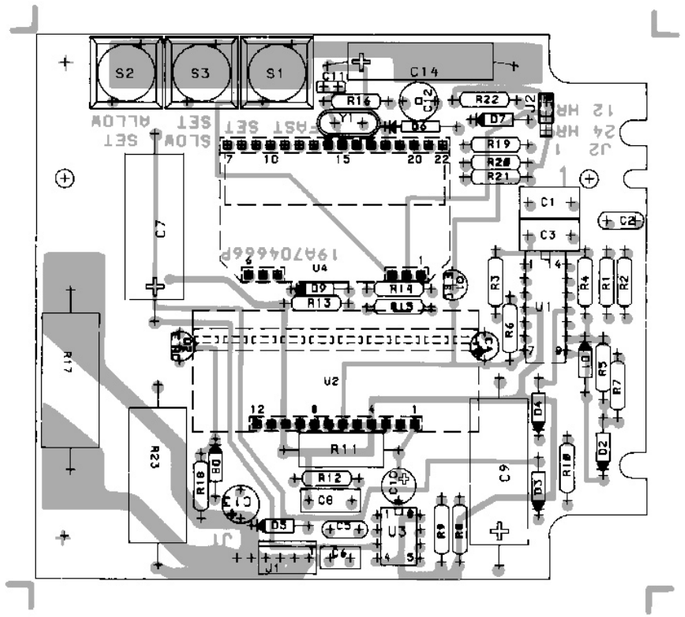
The Vu meter section of the option board consists of: amplifier, U1D, R1, R2, and C2; DC amplifier U1B, R6, and C4; full wave rectifier D1, D2, and U1C; display control switch Q1; negative supply converter U3, D3, and D4; and the Vu display. The Vu meter provides an audio transmit metering function that allows the user to monitor mic output level during transmission.

The Vu meter is operational only when the mic is keyed causing the PTT line to be active (low). The low level is coupled through D9 to the base of display control switch Q1 causing it to turn off. This allows any audio present at the output of DC amplifier U1B to reach the Vu display. When the PTT line is at a high level Q1 clamps any audio present to ground preventing the Vu display from being activated when not actually transmitting.

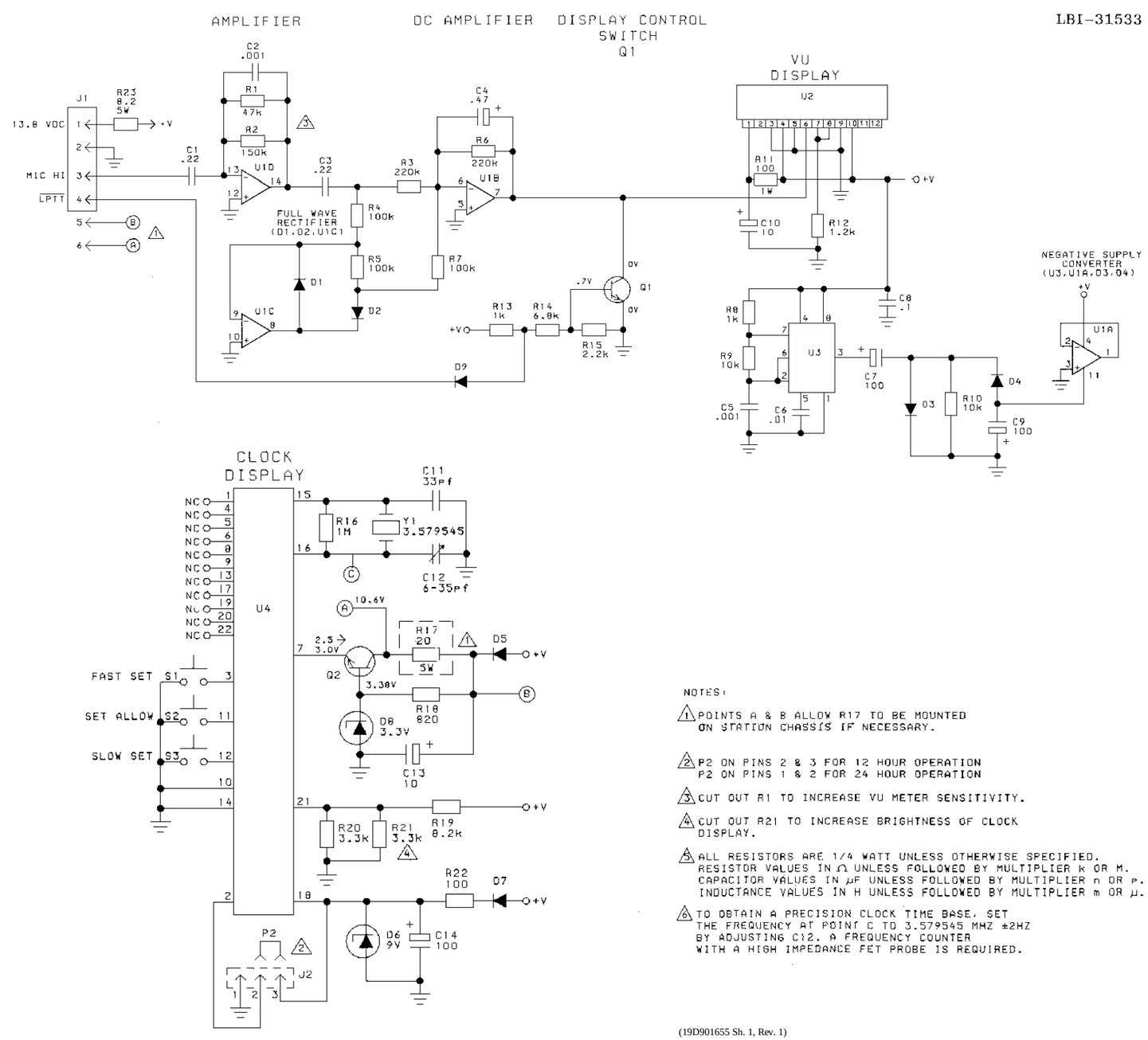
When transmit mic audio is applied to the MIC HI line the signal is coupled to amplifier circuit U1D. Resistors R1 and R2 determine the sensitivity of the Vu meter. R1 may be removed to increase the sensitivity.

The output of the amplifier is coupled to the full wave rectifier circuit consisting of D1, D2 and U1C. The rectified signal is then amplified by the op amp circuit consisting of U1B and associated circuitry. The signal is then applied to the Vu meter display.

The Vu meter display provides an indication that varies according to the input level on pin 6. As the signal applied gets stronger more segments on the bar graph illuminate. When the red segments glow this indicates that audio distortion is being approached and the input signal should be adjusted accordingly.

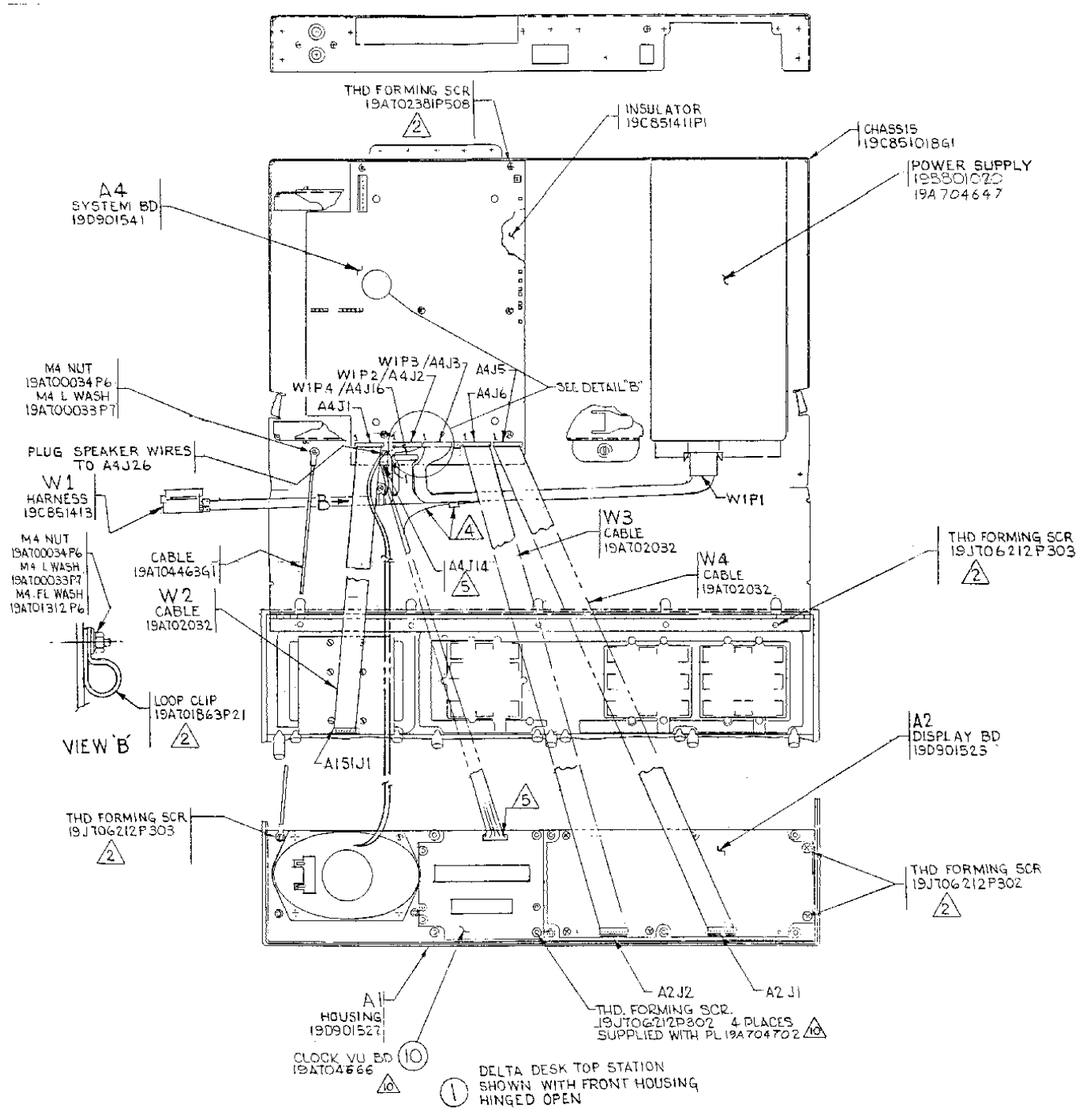


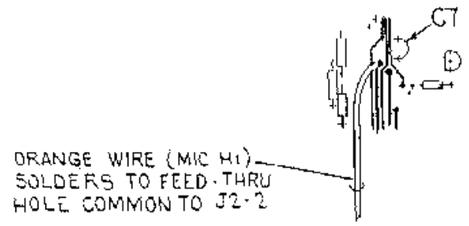
(19D901629 Sh. 1, Rev. 1)
(19A704629 Sh. 1, Rev. 0)
(19A704629 Sh. 2, Rev. 0)

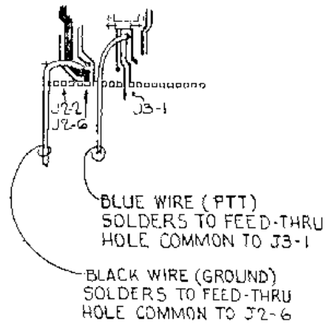


(19D901655 Sh. 1, Rev. 1)

CLOCK/VU METER OPTION







DETAIL "B"

NOTES (CONT.):

10. INSTALLATION INSTRUCTIONS DELTA DESK TOP STATION CLOCK/VU METER BD. OPTION

1. MAKE SURE POWER SWITCH IS OFF.
2. MOUNT CLOCK/VU METER BOARD BESIDE DISPLAY BOARD ON FOLD OUT FRONT PANEL USING FOUR THREAD FORMING SCREWS, 19J706212P302.
3. PLUG 4 PIN PLUG ONTO J1 OF CLOCK/VU METER BD.
4. APPLY WIRE SPLICE 19A116849P11 ONTO WIRE FROM P1-3 (POWER SUPPLY PLUG), AND WIRE 1 (RED) FROM CLOCK/VU METER CABLE, PART OF PL19A704702
5. PLUG 3 PIN PLUG ONTO J14 OF STATION SYSTEM BD. (REVISION "A" OR HIGHER).
6. IF SYSTEM BD IS EARLIER THAN REV "A", REPLACE STEP (5) ABOVE WITH THE FOLLOWING:

6A CUT BLACK, BLUE & ORANGE WIRES CLOSE TO 3 PIN PLUG & DISCARD PLUG. CUT EACH WIRE TO APPROPRIATE LENGTH AS DICTATED BY PROPER WIRE DRESS PER LOCATION OF ENDS DISCRIBED BELOW.

6B SOLDER WIRES INTO FEED THRU HOLES ON SYSTEM BOARD AS SHOWN IN DETAIL "B".

CLOCK/VU METER