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ES–195

MASTER CALENDAR/ SWITCHER

Operation and Maintenance Manual

The ES-195 is a Master Calendar/ Switcher designed to receive ESE time code (TC89, or TC76 in 24 hr. format only) from an ESE master clock and outputs an ASCII RS-232C signal for synchronizing a Grass Valley Master-21 switcher. The unit repeats the time of day data while adding system, unless power is lost (unless the battery- backup option has been installed). The unit outputs the 'Vortex' ASCII format (1200 baud, 8 bit, no parity, 1 stop). The data is transmitted once per second, in the following manner:

<STX> Us Ts Um Tm Uh Th UD TD UM TM UY TY S <ETX>

<STX> = ^B = ASCII 02h
Us = Unit seconds Ts = Tens seconds
Um = Unit minutes Tm = Tens minutes
Uh = Unit hours Th = Tens hours
UD = Unit day TD = Tens days
UM = Unit month TM = Tens months
UY = Unit year TY = Tens year
S = character "S"
<ETX> = ^C = ASCII 03h

The Time or Calendar display is determined by the front- panel TIME/DAY switch. All Displays are .56" yellow LED's. The calendar is set by means of a 3-postion toggle switch on the front panel. The digit pair to be set is first selected by momentarily pressing the switch up to the SELECT position repeatedly until the desired digit pair flashes (the SELECT mode is normally 'OFF'; the SELECT switch sequentially selects the digit pairs in the order Month-Day-Year; the position following that is 'OFF'). Pressing the switch to the SET position momentarily will advance the digit pair one count; holding it down will cause the count to advance automatically. This process is repeated until the entire display is set as desired. When the SELECT mode is 'OFF', the display will return to the Time display if it has been selected.

The ES-195 also outputs ESE time code containing both Time and Date data (TC90 type, receivable on the ES-2559E or ESE 'A' type slaves). The time code input and output are accessible on rear-mounted BNC connectors. The RS-232C output is accessible on the rear-mounted DB9 connector. Pin 2 is data; pin 5 is ground.

SAFETY INSTRUCTIONS

Please review the following safety precautions. If this is the first time using this unit, then read this manual before installing or using the unit. If the unit is not functioning properly, please contact the ***ESE*** factory or system installer. Failure to follow these safety instructions could result in injury to you or damage to the unit.

Be careful with electricity:

- **Power outlet**: To prevent electric shock, be sure the electrical plug used on the unit's power cord matches the electrical outlet used to supply power to the unit. Only connect the power cord to a power source that operates between 110 – 120 VAC, 50/60 Hz. If option J is ordered, only connect the power cord to a power source that operates at 220 VAC, 50/60 Hz. If option UL is ordered, only connect the wall wart adapter to a power source that operates at 120 VAC, 60 Hz. If option J/UL is ordered, only connect the line cord of the adapter to a power source that operates between 100 – 240 VAC, 47 – 63 Hz.
- **Power cord**: Be sure the power cord is routed so that it will not be stepped on or pinched by heavy items.
- **Power overloading**: Avoid overloading electrical outlets or extension cords which otherwise could result in electric shock or fire.
- **Lightning**: For protection from lightning or when the unit is left unattended for a long period, disconnect it from the power source.
- **Protect other equipment**: Unplug the unit before connecting any other equipment. Connect all equipment to the unit before plugging in any power cords to the power source.

WARNING!

TO REDUCE THE RISK OF ELECTRICAL SHOCK, UNPLUG THE UNIT BEFORE REMOVING THE COVER
REFER SERVICING TO QUALIFIED PERSONNEL

Also follow these precautions:

- **Ventilation**: Do not block any ventilation holes on the unit or place any heavy object on top of it. Blocking the airflow could damage the unit. Arrange components so that air can flow freely around the unit. Ensure that there is adequate ventilation to the unit wherever it is placed. Put the unit in a properly ventilated area, away from direct sunlight or any source of heat.
- **Overheating**: Avoid stacking the unit on top of a hot component.
- **Risk of Fire**: Do not place the unit on top of any easily combustible material, such as paper, carpet or fabric.
- **Proper Connections**: Be sure all cables and equipment are connected to the unit as described in this manual.
- **Object Entry**: To avoid electric shock, never stick anything in the holes on the enclosure or remove the cover.
- **Water Exposure**: To reduce the risk of fire or electric shock, do not expose the unit to rain or any other source of moisture.
- **Keep the unit out of the reach of children or it may fall, causing personal injury or damage to the unit**.
- **Always disconnect the power cord from the power outlet when you are not using the unit**. This reduces your risk of electric shocks or fire.
- **Always turn off the unit, disconnect it from the power outlet, and unplug all other cables from before moving the unit**. This reduces your risk of electric shocks or fire.

SPECIFICATIONS

ELECTRICAL: Input power – 110 – 120 VAC, 50/60 Hz, 7 watts maximum
MECHANICAL: Rackmount enclosure 1.75” High x 19” panel x 9.25” Deep

OPTIONS

BBU: When this option (Battery Back-up) is specified, the battery will supply back-up power to the unit for up to eight hours in the event of a power outage (the display will blank during power outages but internal time is maintained).

J: When this option is specified, input voltage is 220 VAC, 50/60 Hz.

UL: When this option is specified, the unit is supplied with a UL approved wall mount power supply.

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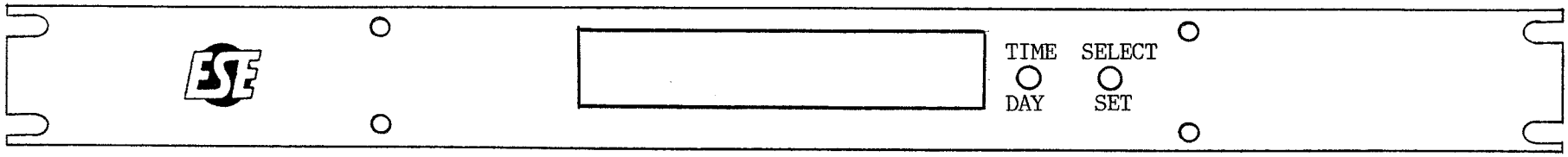
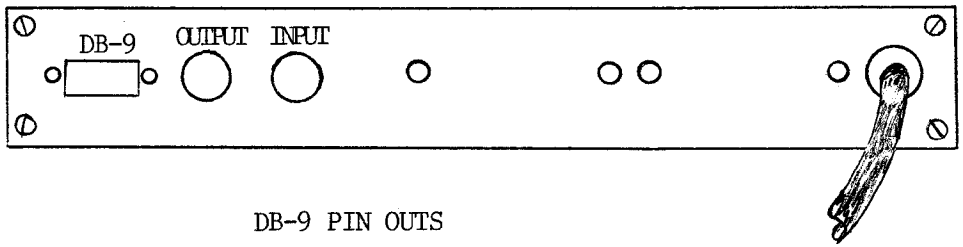
FRONT



REAR



DB-9 PIN OUTS

PIN 2 = DATA
PIN 5 = GROUND

ES-195
PARTS LIST

PCB COMPONENTS

QTY	DESIGNATION	DESCRIPTION	PART NUMBER
1	Z3	INTEGRATED CIRCUIT	LM330T-5.0
1	Z1	INTEGRATED CIRCUIT	8749-195
1	Z2	INTEGRATED CIRCUIT	4503
6	Z6-Z11	INTEGRATED CIRCUIT	4511
3	N1-N3	DISPLAY	LTD 6840Y
1	Q1	TRANSISTOR	PN2222
5	D1-D5	DIODE	1N4003
1	R63	RESISTOR	18 OHM 1/4W
2	R1;R2	RESISTOR	75 OHM 1/2W
1	R64	RESISTOR	150 OHM 1/4W
42	R19-R60	RESISTOR	220 OHM 1/4W
10	R5;R6;R9-R16	RESISTOR	22K OHM 1/4W
2	R3;R66	RESISTOR	51K OHM 1/4W
1	R65	RESISTOR	120K OHM 1/4W
2	C6;C7	CERAMIC CAPACITOR	10 PF 50V
1	C10	CERAMIC CAPACITOR	.01 UF 50V
1	C11	CERAMIC CAPACITOR	.1 UF 50V
1	C9	ELECTROLYTIC CAPACITOR	4.7 UF 10V
1	C4	ELECTROLYTIC CAPACITOR	10 UF 16V
1	C5	ELECTROLYTIC CAPACITOR	100 UF 25V
1	C3	ELECTROLYTIC CAPACITOR	3300 UF 16V
1	C1	ELECTROLYTIC CAPACITOR	4700 UF 10V
1	X1	CRYSTAL	9.2068 MHZ
2	T1;T2	TRANSFORMER	P6465
1		40 PIN DIP SOCKET	
7		16 PIN DIP SOCKET	
1	DB9	FEMALE 9 PIN CONNECTOR	
1		MALE 9 PIN CONNECTOR	
1		9 PIN D-SUB HOOD	
1		LINE CORD	3 WIRE 6'
1		PC BOARD	UCT DISPLAY
1		PC BOARD	UCT-1 LOGIC
1		CASE & HARDWARE	ES-195
2		BNC GND LUG	
1		SPDT SWITCH	SPDT SWITCH
1		C-OFF TOGGLE	C-OFF TOGGLE

IF COMPONENT REMOVAL IS REQUIRED, WE RECOMMEND REMOVING ALL SOLDER USING A 35W OR SMALLER SOLDERING IRON AND 'SOLDER WICK' TO PREVENT DAMAGE TO THE PRINTED CIRCUIT BOARD.

ALL INFORMATION CONTAINED IN THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

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PARTS LIST

OPTIONAL COMPONENTS

QTY	DESIGNATION	DESCRIPTION	PART NUMBER
1	Z4 (BATT. OPT.)	INTEGRATED CIRCUIT	LM317T
1	R17 (BATT. OPT.)	RESISTOR	220 OHM 1/4W
1	R18 (BATT. OPT.)	RESISTOR	1K OHM 1/4W
1	(BATT. OPT.)	BATT. 6V	NP1.3-6
1	(BATT. OPT.)	SWITCH	SPDT
1	(BATT. OPT.)	2A FUSE	2A FUSE
1	(BATT. OPT.)	FUSE HOLDER	
1	(OPT. J)	TRANSFORMER	SSA6-6.3/230
1	(OPT. UL)	TRANSFORMER	AA-061A5-ANY

RS232C BOARD

QTY	DESIGNATION	DESCRIPTION	PART NUMBER
1	Z3	INTEGRATED CIRCUIT	555
1	Z4	INTEGRATED CIRCUIT	1488
2	D2;D3	DIODE	1N4148
1	D1	DIODE	1N4742
1	C5	MYLAR CAPACITOR	.001 UF 100V
3	C2-C4	ELECTROLYTIC CAPACITOR	10 UF 16V
1	R1	RESISTOR	56 OHM 1/2W
1	R8	RESISTOR	1K OHM 1/4W
1	R9	RESISTOR	15K OHM 1/4W
1		8 PIN DIP SOCKET	
1		14 PIN DIP SOCKET	
1		PC BOARD	ES-1424J

NOTE: THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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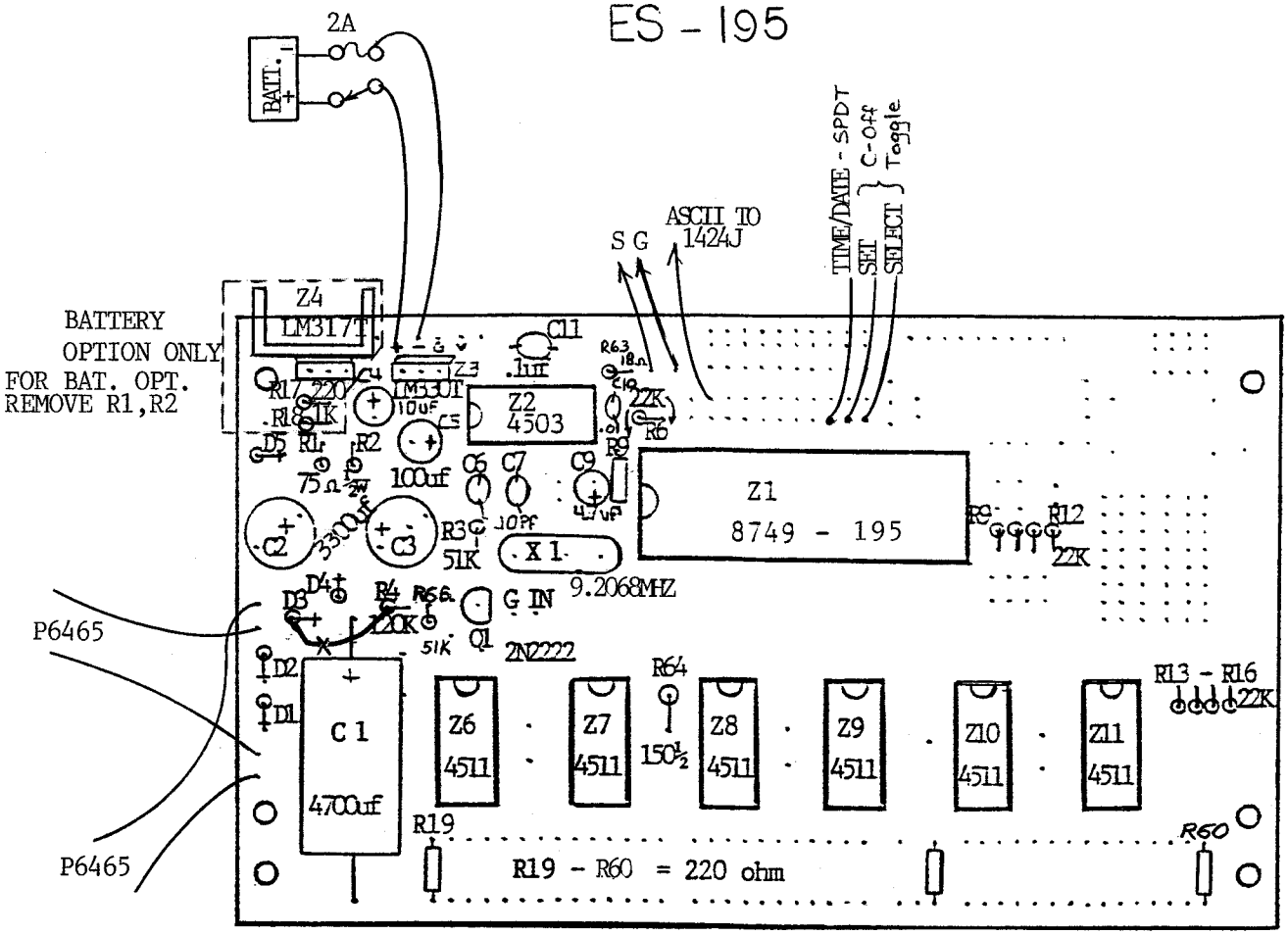
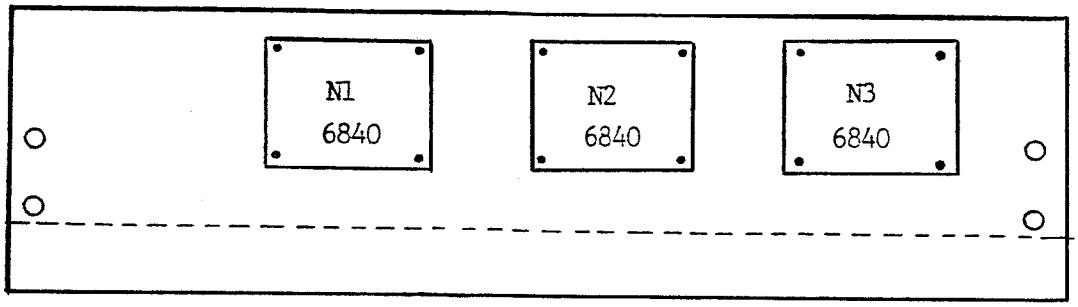
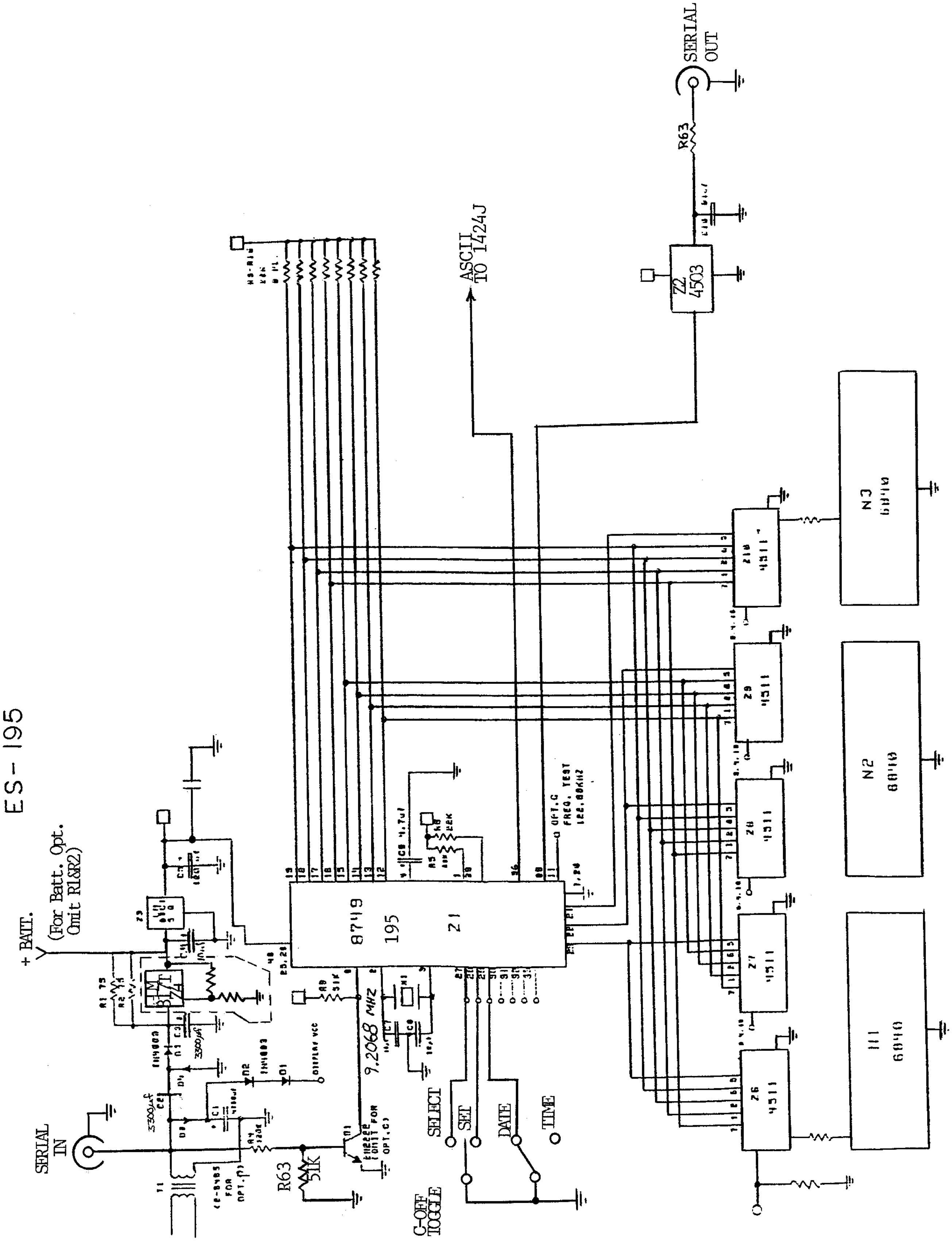


D1-D5 = IN4003

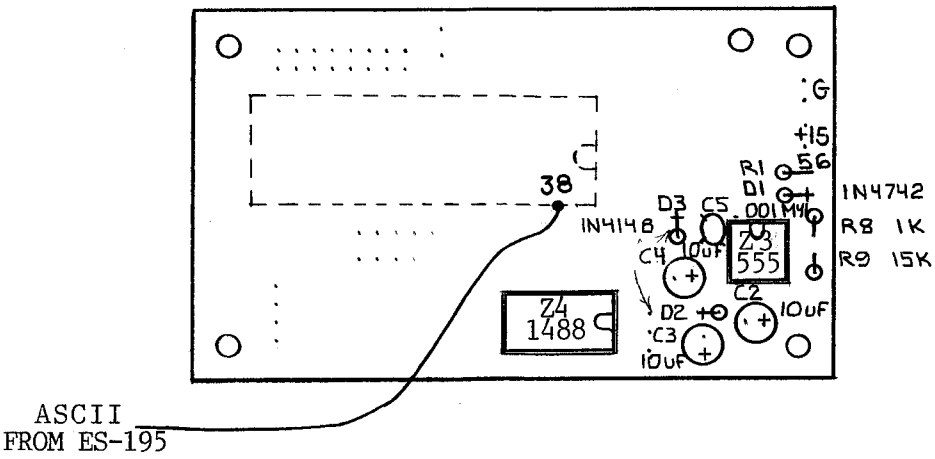
C7=5-50pf TRIMMER FOR OPT. C
Or BATTERY OPT.

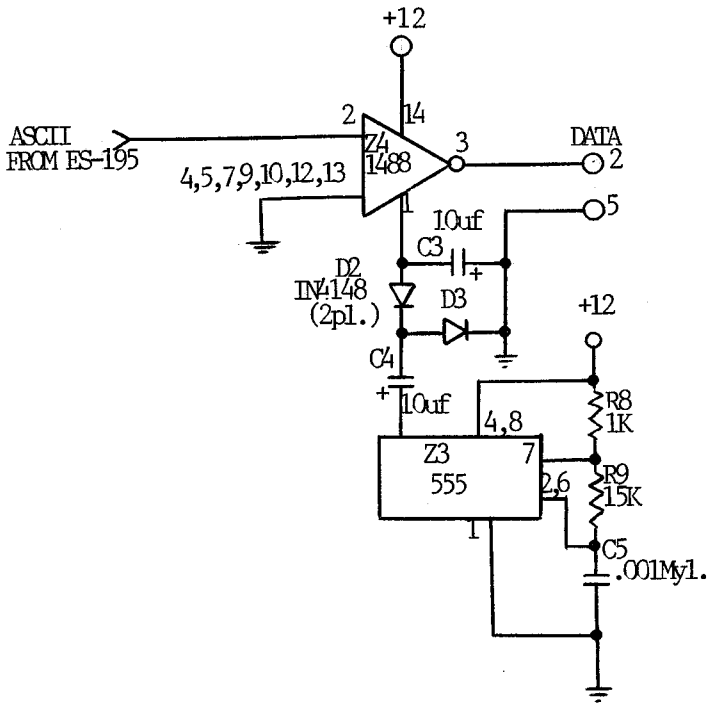


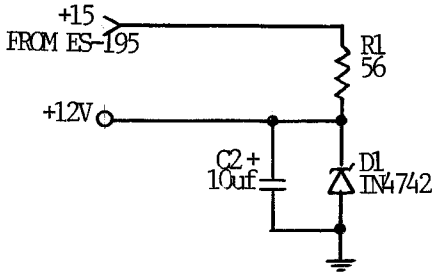

ES-195
+ BATT.
(For Batt. Opt. Omit R1&R2)
SERIAL IN
SERIAL OUT
ASCII TO 1424J
Z2 4503
R63
R63 51K
9.2068 MHZ
8749
195
Z1
SELECT
SET
DATE
TIME
C-OFF TOGGLE

SERIAL INTERFACE (RS-232C)

FOR ES - 195







REVISION HISTORY

Revision 1.0 (6/1/93): First version.

Revision 1.1 (11/22/10): The safety instructions were added.