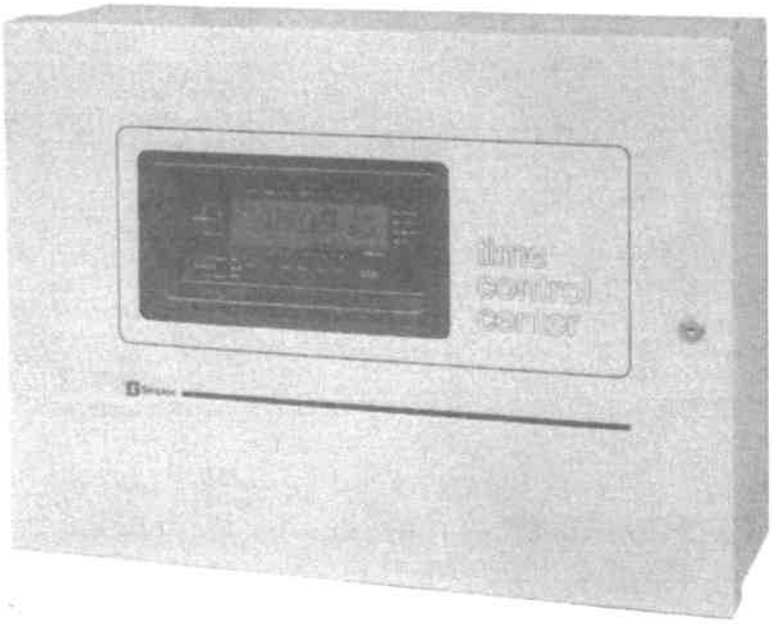
Simplex

6351 and 6400 Time Control Centers

Installation/Operating Instructions



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All specifications and other information shown were current as of publication, and are subject to change without notice.

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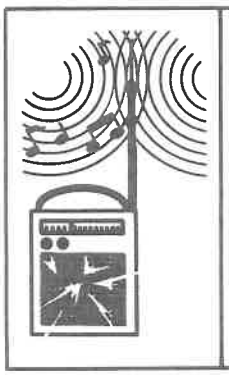


WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

CAUTION

ELECTRICAL HAZARD

Disconnect electrical power when making any internal adjustments or repairs.
Installation and servicing should be performed by qualified Simplex representatives.

TABLE OF CONTENTS

PAGE

INSTALLATION INSTRUCTIONS

SECTION 1 – PRE-POWER ADJUSTMENTS

General Notes 4
Setting DIP Switches on CPU Board 5
Setting DIP Switches on 6400 Coded/Impulse Board, 6400 Coded Board, or 6351/6400 Impulse Board (Optional) 7
Setting DIP Switches on WWV Interface Board 10

SECTION 2 – INSTALLATION WIRING

General Notes 11
Connections to Power/Interface Board 11
Connections to Impulse Interface Board (Optional) 18
Connections to 6800 Coordinated Universal Time Receiver (Optional) 28
Connection to Extended Battery (Optional) 29
Final Checkout 29

OPERATING INSTRUCTIONS

SECTION 3 – OPERATING MANUAL OVERRIDE SWITCHES (STANDARD EQUIPMENT)

Operating Manual Override Switch(es) for ON/OFF and PULSE type events (6400 only) 30
Operating Manual Override Switch(es) for DELAY Events (6400 only) 30
Operating Manual Override Switch(es) for SYNCHRONOUS Output 30
Operating Manual Override Switch(es) for GENERATOR Output 31
Operating Manual Override Switch(es) for SERIAL BCD Output 31

SECTION 4 – OPERATING MANUAL OVERRIDE SWITCHES (OPTIONAL EQUIPMENT)

Operating Manual Override Switch (CIRCUIT ONE) for REMOTE RELAYS 32
Operating Manual Override Switch for SECONDARY CLOCK Output 32

APPENDIX A – GENERAL MOUNTING INSTRUCTIONS 34

APPENDIX B – SPECIAL INSTRUCTIONS FOR RACK-MOUNT MODEL (6400 ONLY)

General Notes 36
Mounting Instructions – Slides & Cable Carrier 36

APPENDIX C – WWV INTERFACE BOARD – INSTALLATION INSTRUCTIONS 38

APPENDIX D – 6351 KEYPAD OPERATION AND BASIC KEYPAD ENTRIES 39

Introduction 39

Keypad Operation 39

General Notes 39
Keypad Normally Active vs. Keypad Normally Inactive 40
Keypad Modes 40

Basic Entries 41

To Enter Hour Format (12 or 24) for LCD 41
To Set the Time and Day of the Week 41
To Set the Date 41
To Program the Automatic Daylight Saving Time (DST) Changes 42

LIST OF ILLUSTRATIONS

Figure		Page
1	CPU BOARD	5
2	BCD OUTPUT FORMAT SETTINGS	5
3	GENERATOR SETTINGS	6
4	KEYPAD LOCKOUT & TIMEKEEPING SETTINGS	6
5	SYNCHRONOUS SETTINGS	6
6	6400 CODED/IMPULSE BOARD	7
7	6400 CODED BOARD	7
8	6351/6400 IMPULSE BOARD	7
9	REMOTE CODED RELAY SETTINGS (6400 ONLY)	8
10	SECONDARY CLOCK SETTINGS	8
11	SECONDARY CLOCK TYPES	9
12	RAPID RATE ADVANCE SETTINGS (SIMPLEX IMPULSE SECONDARY CLOCKS – 59TH, 58TH, OR 44TH MINUTE REFERENCE)	9
13	IMPULSE ACCUMULATOR SETTINGS	9
14	WWV INTERFACE BOARD	10
15	WWV COMMUNICATION SETTINGS	10
16	WWV BAUD RATE SETTINGS	10
17	POWER/INTERFACE BOARD	11
18	AC POWER WIRING 115VAC	12
19	AC POWER WIRING 230VAC	12
20	TYPICAL WIRING FOR SIX CIRCUITS OF BELLS/HORNS USING EXTERNAL POWER (6400 ONLY)	13
21	TYPICAL WIRING FOR SIX CIRCUITS OF BELLS/HORNS USING 6400 LINE VOLTAGE	13
22	WIRING FOR EXTERNAL INPUT	14
23	CONNECTING TCC TO CELESTRA SECONDARY CLOCKS	14
24	CONNECTING TCC TO EXTERNALLY-POWERED SYNCHRONOUS SECONDARY CLOCKS	15
25	CONNECTING TCC TO SYNCHRONOUS SECONDARY CLOCKS USING TCC LINE VOLTAGE	15
26	CONNECTING TCC TO EXTERNALLY-POWERED TRANSMITTER/ GENERATOR	16
27	CONNECTING TCC TO TRANSMITTER/GENERATOR USING TCC LINE VOLTAGE	16
28	CONNECTING 6400 TO EXTERNALLY-POWERED CODED RELAYS (OPTIONAL)	17
29	CONNECTING 6400 TO CODED RELAYS USING 6400 LINE VOLTAGE (OPTIONAL)	17
30	IMPULSE INTERFACE BOARD	18
31	IMPULSE POWER SUPPLY WIRING 115VAC (OPTIONAL)	19

LIST OF ILLUSTRATIONS (cont'd)

Figure		Page
32	IMPULSE POWER SUPPLY WIRING 230VAC (OPTIONAL)	20
33	CONNECTING TCC TO 2-WIRE IMPULSE SECONDARY CLOCKS (REVERSE POLARITY) – TYPES 1, 2, 3, 4, 5, 13, 14, & 15 (OPTIONAL)	21
34	CONNECTING TCC TO 3-WIRE IMPULSE SECONDARY CLOCKS (B DISCONNECT) – TYPES 1, 2, 3, 13, 14, & 15 (OPTIONAL)	22
35	CONNECTING TCC TO 3-WIRE SYNCHRONOUS SECONDARY CLOCKS – 6, 7, 8, & 9 (OPTIONAL)	23
36	CONNECTING TCC TO 2 OR 3-WIRE DUAL MOTOR SECONDARY CLOCKS – TYPE 10 (OPTIONAL)	24
37	CONNECTING TCC TO 3-WIRE DUAL MOTOR SECONDARY CLOCKS – TYPES 11 & 12 (OPTIONAL)	25
38	CONNECTING TCC TO 3-WIRE IMPULSE SECONDARY CLOCKS – TYPE 16 (OPTIONAL)	26
39	CONNECTING TCC TO 2-WIRE DUAL VOLTAGE IMPULSE SECONDARY CLOCKS – TYPE 17 (OPTIONAL)	27
40	CONNECTIONS TO 6800 COORDINATED UNIVERSAL TIME RECEIVER (OPTIONAL)	28
41	NORMAL SYNCHRONOUS CLOCK CORRECTION SIGNALS	30
42	ADVANCE RATES (IMPULSE SECONDARY CLOCKS)	32
43	MOUNTING TCC DOOR, RETAINER PANEL, & MOUNTING PLATE TO BACK BOX	34
44	CONNECTING CPU TO POWER/INTERFACE BOARD	35
45	INSTALLING RACK-MOUNT SLIDES (6400 ONLY)	37
46	INSTALLING RACK-MOUNT CABLE CARRIER (6400 ONLY)	37
47	INSTALLING WWV INTERFACE BOARD	38
48	LCD DISPLAY	39
49	KEYPAD	40
50	LCD AFTER DEPRESSING TIME KEY	41
51	LCD AFTER DEPRESSING DATE KEY	41
52	LCD AFTER DEPRESSING DST KEY	42

INSTALLATION INSTRUCTIONS

SECTION 1

IMPORTANT

The 6351 provides the master clock functions of the 6400 but does not have rack-mount packaging or circuit programming.

Note: The following information is for both the 6351 and 6400 Time Control Centers (TCCs) unless otherwise indicated.

PRE-POWER ADJUSTMENTS

General Notes

A. You may surface, semi-flush or rack mount the 6400 box. (See Appendix A for general mounting instructions and Appendix B for rack mounting instructions). You may also retrofit the 6400 into an existing box. (See **6400 Retrofit Instructions** publication.) However, you may only surface or semi-flush mount the 6351; there is no 6351 rack-mount model.

- If a TCC is to be semi-flush mounted, a separate package containing a trimplate was shipped with the unit. Fit the trimplate over the box before sliding the TCC into place.

- If an existing box is used, mount the provided backplate to inside rear of box before hanging the TCC.

B. You should **hard-wire** the TCC to a dedicated, **fused** power source.

- Knockouts have been provided for this purpose.

C. Remove knockout(s) before hanging the TCC.

Setting DIP switches on CPU Board

The CPU Board (Figure 1) is one assembly consisting of two separate boards and is located directly behind the TCC's front panel. To gain access to CPU Board 2, remove the four screws from the front panel (top cover for rack mount model) and gently pull the panel away from its box. (It is not necessary to disconnect the ribbon cable that runs from J7 of the CPU Board 1 to P1 of the Power/Interface Board – see page 11 for location of P1.) Adjustments on the CPU Board consist of setting switches 1 thru 10 of DIP Switch Package SW10 as shown in Figures 2, 3, 4 & 5:

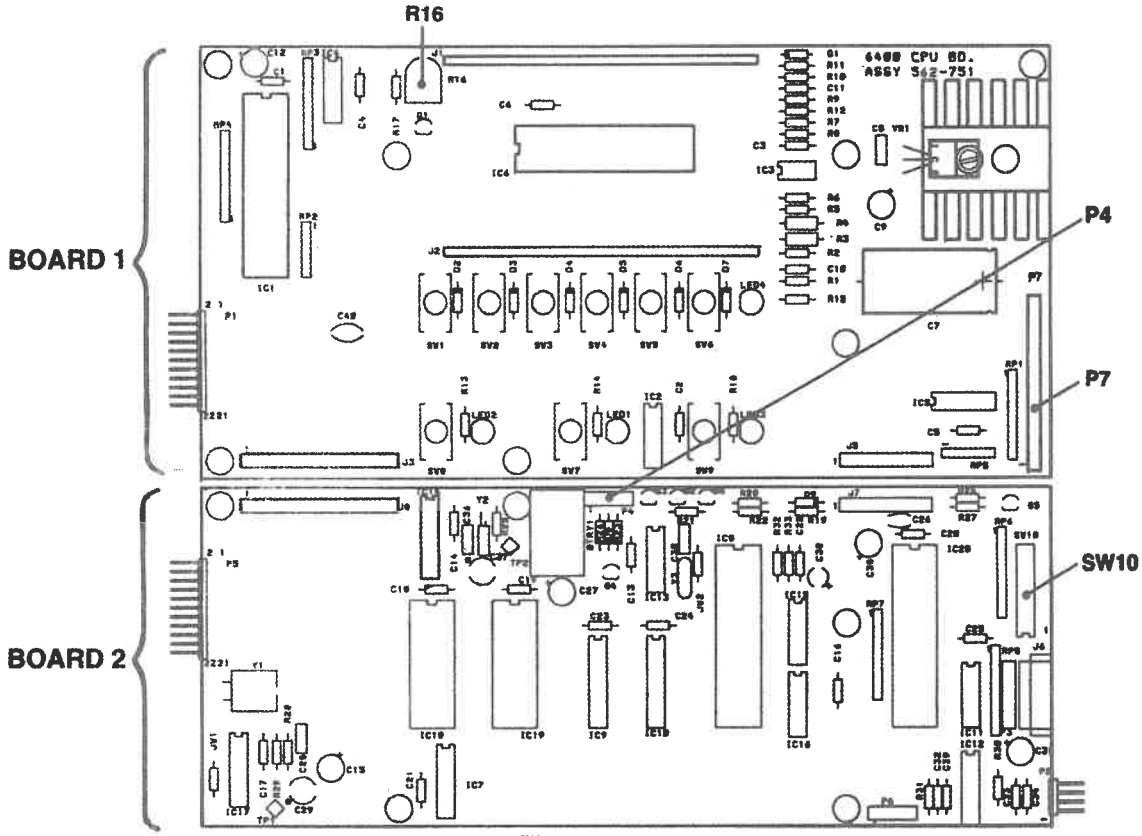


Figure 1
CPU BOARD

DIP SWITCH SETTINGS – CLOSED = 0 = ON
OPEN = 1 = OFF

	SETTING	DESCRIPTION
DIP SWITCH #1	ON	STANDARD BCD FORMAT (TIME ONLY)
	OFF	ADVANCED BCD FORMAT (TIME AND DATE)
DIP SWITCH #2	ON	BCD HOLDBACK DISABLED
	OFF	*BCD HOLDBACK ENABLED
‡DIP SWITCH #9	ON	SELECTING 24-HOUR BCD FORMAT
	OFF	SELECTING 12-HOUR BCD FORMAT

* Enabling BCD holdback stops the 2320 clock code converter for one hour during programmed DST change.

‡ There is no relationship between LCD display format (12 or 24 hours) and BCD format (12 or 24 hours). Therefore, even though the LCD display may show a 12-hour format, the 6400 can still send out 24-hour BCD data (if so selected). The reverse – 24-hour LCD display and 12-hour BCD data – is also true.

Figure 2
BCD OUTPUT FORMAT SETTINGS

DIP SWITCH	#3	#4	#5	*DESCRIPTION
SETTINGS	ON	ON	ON	ALL CIRCUITS WITHOUT GENERATOR CONTROL (CTRL)
	ON	ON	OFF	CIRCUIT 1 WITH GENERATOR CTRL
	ON	OFF	ON	CIRCUITS 1 & 2 W/GENERATOR CTRL
	ON	OFF	OFF	CIRCUITS 1, 2 & 3 W/GENERATOR CTRL
	OFF	ON	ON	CIRCUITS 1, 2, 3 & 4 W/GENERATOR CTRL
	OFF	ON	OFF	CIRCUITS 1, 2, 3, 4 & 5 W/GENERATOR CTRL
	OFF	OFF	OFF	CIRCUITS 6 WITH GENERATOR CTRL
	OFF	OFF	ON	ALL CIRCUITS WITH GENERATOR CTRL

* Generator is pre-started a minute in advance of generating a signal.

Figure 3
GENERATOR SETTINGS

	SETTING	DESCRIPTION
DIP SWITCH #6	ON	*KEYPAD CONTINUOUSLY ENABLED
	OFF	KEYPAD ENABLED BY CODED KEYPAD ENTRY
DIP SWITCH #7	ON	SELECTING DC QUARTZ CRYSTAL FOR TIMEKEEPING
	OFF	SELECTING AC LINE FOR TIMEKEEPING

* Keypad active LED is always lit when keypad is enabled.

Figure 4
KEYPAD LOCKOUT & TIMEKEEPING SETTINGS

	SETTING	DESCRIPTION
DIP SWITCH #8	ON	SYNCHRONOUS CORRECTION HOLDBACK DISABLED
	OFF	*SYNCHRONOUS CORRECTION HOLDBACK ENABLED
DIP SWITCH #10	ON	SELECTING 24-HOUR SYNCHRONOUS FORMAT
	OFF	SELECTING 12-HOUR SYNCHRONOUS FORMAT

* The TCC pulses every minute to hold back 2320 clock code converter for daylight saving time correction.

Figure 5
SYNCHRONOUS SETTINGS

Setting DIP switches on 6400 Coded/Impulse Board, 6400 Coded Board or 6351/6400 Impulse Board (Optional)

The 6400 Coded/Impulse Board (Figure 6), the 6400 Coded Board (Figure 7), or the 6351/6400 Impulse Board (Figure 8) are located directly behind the TCC's front panel. (Only one of these three boards is contained in a TCC.) To gain access to the supplied board, remove the four screws from the front panel and gently pull the panel away from its box. (It is not necessary to disconnect the ribbon cable.) The 6400 Coded/Impulse Board controls both impulse secondary clocks and remote coded/dual coded relays; the 6400 Coded Board controls just remote relays; and the 6351/6400 Impulse Board controls just impulse secondaries. Set the switches on DIP Switch Package SW1 as follows:

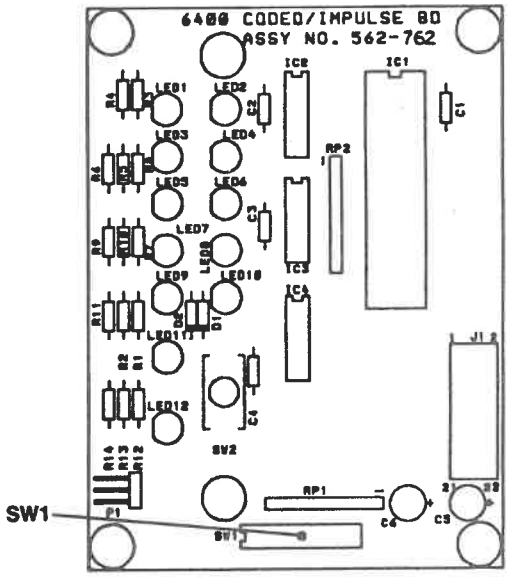


Figure 6
6400 CODED/IMPULSE BOARD
(See Figures 9 through 13)

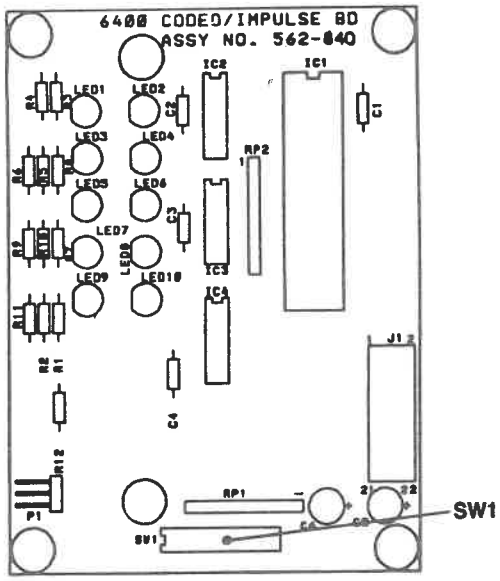


Figure 7
6400 CODED BOARD
(See Figure 9)

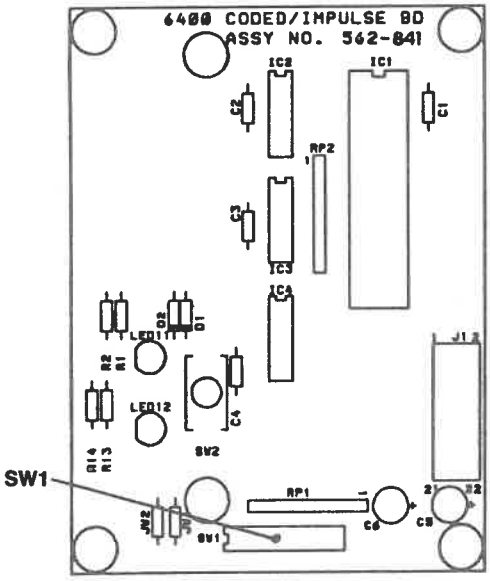


Figure 8
6351/6400 IMPULSE BOARD
(See Figures 10 through 13)

DIP SWITCH SETTINGS – CLOSED = 0 = ON
OPEN = 1 = OFF

DIP SWITCH	#1	#2	DESCRIPTION
SETTINGS	ON	ON	CODED CONTROL DISABLED
	OFF	ON	CODED CONTROL ENABLED WITHOUT DELAY
	ON	OFF	CODED CONTROL ENABLED WITH 5 SECOND DELAY
	OFF	OFF	CODED CONTROL ENABLED WITH 10 SECOND DELAY

Figure 9
REMOTE CODED RELAY SETTINGS (6400 ONLY)

DIP SWITCH	#3	#4	#5	#6	#7	CLOCK TYPE (SEE FIGURE 11)
SETTINGS	ON	ON	ON	ON	ON	1
	OFF	ON	ON	ON	ON	2
	ON	OFF	ON	ON	ON	3
	OFF	OFF	ON	ON	ON	4
	ON	ON	OFF	ON	ON	5
	OFF	ON	OFF	ON	ON	6
	ON	OFF	OFF	ON	ON	7
	OFF	OFF	OFF	ON	ON	8
	ON	ON	ON	OFF	ON	9
	OFF	ON	ON	OFF	ON	10
	ON	OFF	ON	OFF	ON	11
	OFF	OFF	ON	OFF	ON	12
	ON	ON	OFF	OFF	ON	13
	OFF	ON	OFF	OFF	ON	14
	ON	OFF	OFF	OFF	ON	15
	OFF	OFF	OFF	OFF	ON	16
	ON	ON	ON	ON	OFF	17
	OFF	OFF	OFF	OFF	OFF	DISABLED

Figure 10
SECONDARY CLOCK SETTINGS

CLOCK TYPE NO.	DESCRIPTION OF SECONDARY CLOCK(S)
1	SIMPLEX 59TH MINUTE REFERENCE
2	SIMPLEX 58TH MINUTE REFERENCE
3	SIMPLEX 44TH MINUTE REFERENCE
4	1-MINUTE REVERSE POLARITY
5	½-MINUTE REVERSE POLARITY
6	HONEYWELL, FARADAY (1300 SERIES), CINCINNATI (D SYNCHRONOUS)
7	NATIONAL TIME (HOURLY)
8	NATIONAL TIME (12-HOUR CORRECTION)
9	STROMBERG (SYNCHRONOUS, 56TH MINUTE REFERENCE, ELECTRONIC)
10	STANDARD ELECTRIC TIME (FMT-DUAL MOTOR, COUCH (C452014 THROUGH C452019 AND C452133 THROUGH C452145))
11	SIMPLEX 45TH MINUTE REFERENCE (DUAL MOTOR)
12	SIMPLEX 59TH MINUTE REFERENCE (DUAL MOTOR)
13	CINCINNATI D6 (IMPULSE, 12-HOUR CORRECTION)
14	CINCINNATI D3
15	STROMBERG (IMPULSE, 58TH MINUTE REFERENCE)
16	STANDARD ELECTRIC TIME (AR2A AND AR3A-IMPULSE, 60TH MINUTE REFERENCE)
17	STANDARD ELECTRIC TIME (AR2-IMPULSE, 59TH MINUTE REFERENCE)

Figure 11
SECONDARY CLOCK TYPES

DIP SWITCH	#8	#9	DESCRIPTION
SETTINGS	ON	ON	1 MINUTE EVERY 2 SECONDS (1 SECOND ON, 1 SECOND OFF)
	OFF	ON	1 MINUTE EVERY 4 SECONDS (2 SECONDS ON, 2 SECONDS OFF)
	ON	OFF	1 MINUTE EVERY 7 SECONDS (2 SECONDS ON, 5 SECONDS OFF)
	OFF	OFF	UNUSED

Figure 12
RAPID RATE ADVANCE SETTINGS (SIMPLEX IMPULSE SECONDARY CLOCKS – 59TH, 58TH OR 44TH MINUTE REFERENCE)

	SETTING	DESCRIPTION
DIP SWITCH #10	ON	ACCUMULATOR IS DISABLED
	OFF	ACCUMULATOR IS ENABLED

Figure 13
IMPULSE ACCUMULATOR SETTINGS

Setting DIP switches on WWV Interface Board

The WWV Interface Board (Figure 14) is located directly behind the TCC's front panel. To gain access to this board, remove the four screws from the front panel and gently pull the panel away from its box. (It is not necessary to disconnect the ribbon cable.) Then, remove the plate that covers the board. Adjustments on the WWV Interface Board consist of setting switches 5 thru 10 of DIP Switch Package SW1 (switches 1 through 4 are unused) as shown in Figures 15 and 16.

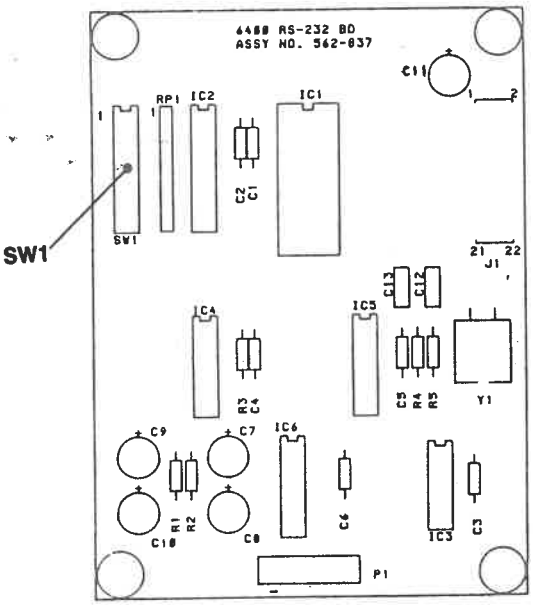


Figure 14
WWV INTERFACE BOARD

DIP SWITCH SETTINGS – CLOSED = 0 = ON
OPEN = 1 = OFF

DIP SWITCH	#5	#6	#7	#8	DESCRIPTION
	ON	ON	ON	ON	COMMUNICATIONS DISABLED
SETTINGS	ON	ON	ON	OFF	WWV OPTION ENABLED

Figure 15
WWV COMMUNICATION SETTINGS

DIP SWITCH	#9	#10	BAUD RATE
	ON	ON	300
	OFF	ON	*1200
SETTINGS	ON	OFF	2400
	OFF	OFF	4800

*The recommended baud rate setting is 1200.

Figure 16
WWV BAUD RATE SETTINGS

SECTION 2

INSTALLATION WIRING

General Notes

1. Ground the TCC (use the green screw provided to attach the ground wire).
2. Using appropriate fasteners, mount the TCC on or in the wall.
3. Shift P4 jumper on CPU Board 2 (see Figure 1 on page 5) from pins 2 & 3 to pins 1 & 2.

- Jumper P4 hooks up a rechargeable battery which provides power for time-tracking and program retention during AC power outages of seven or more days.

Connections to Power/Interface Board

The Power/Interface Board (Figure 17) is located at the rear of the TCC's box. (Board is located at the bottom of the box for a rack-mounted model. Therefore, four screws at the top of the box must be removed in order to get at the board.) To gain access to this board, remove the four screws from the front panel and gently pull the panel away from its box. (It is not necessary to disconnect the ribbon cable that runs from P1 of the Power/Interface Board to the CPU Board.) Connections are made to the Power/Interface Board as follows in Figures 18 through 29:

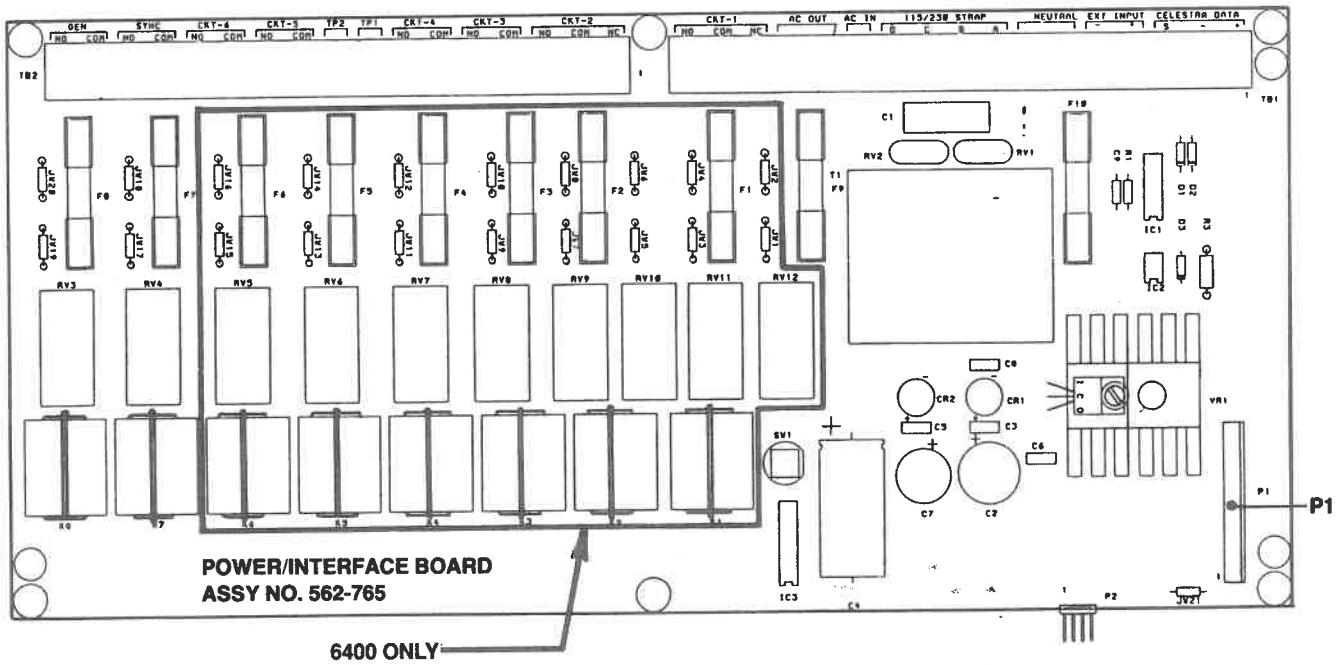


Figure 17
POWER/INTERFACE BOARD

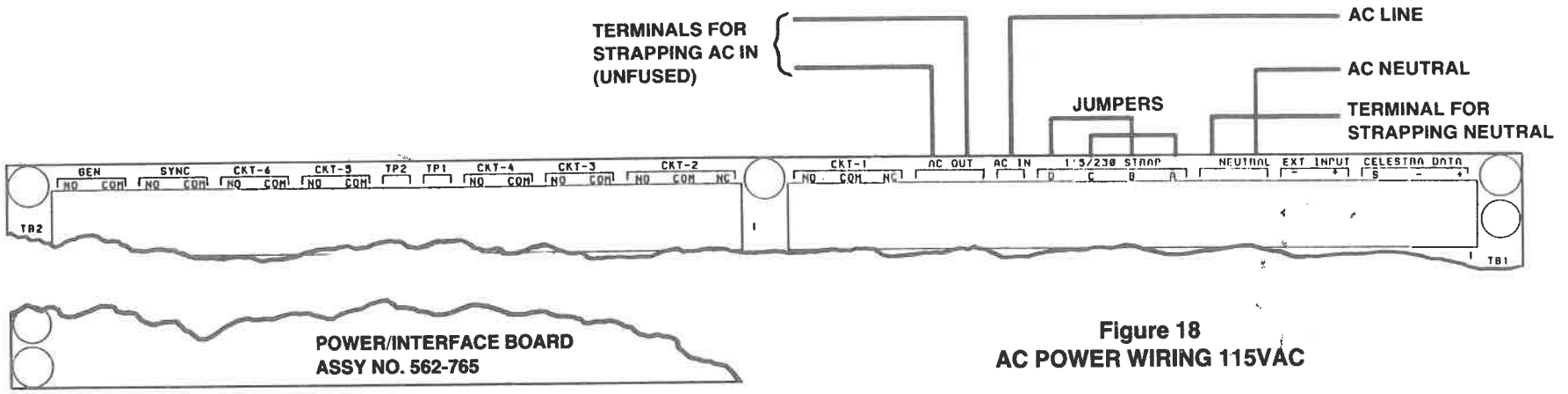


Figure 18
AC POWER WIRING 115VAC

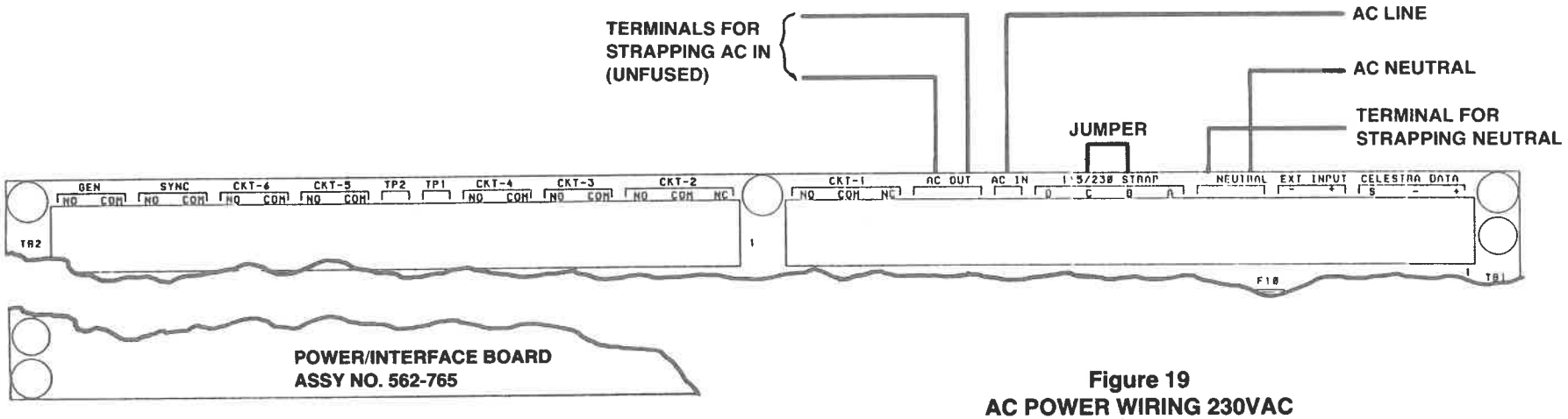


Figure 19
AC POWER WIRING 230VAC

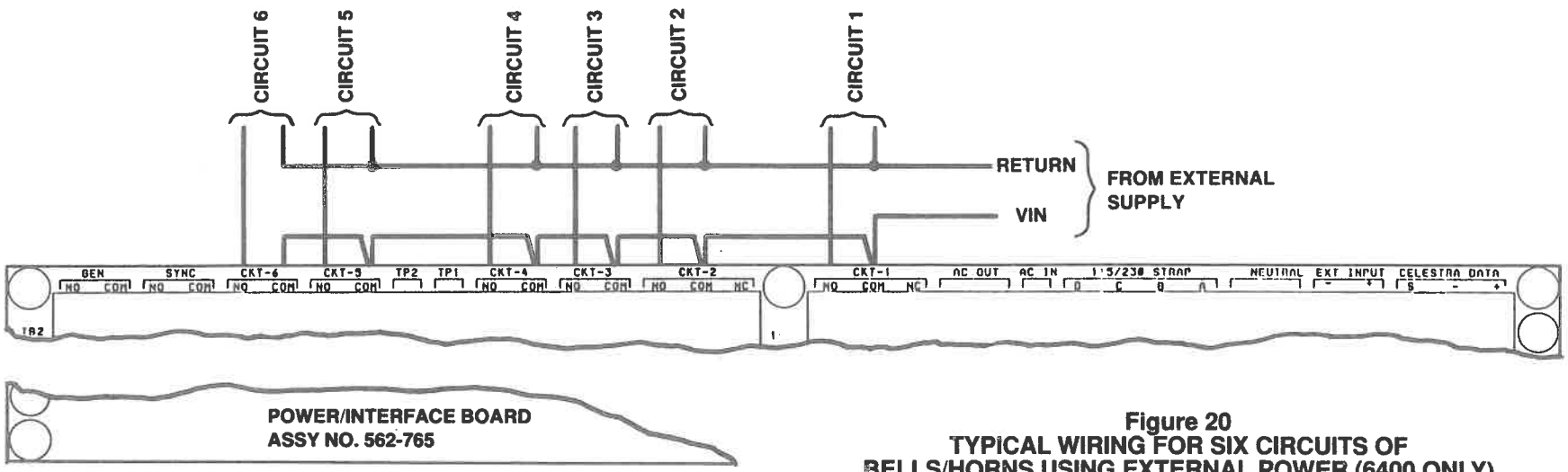


Figure 20
TYPICAL WIRING FOR SIX CIRCUITS OF BELLS/HORNS USING EXTERNAL POWER (6400 ONLY)

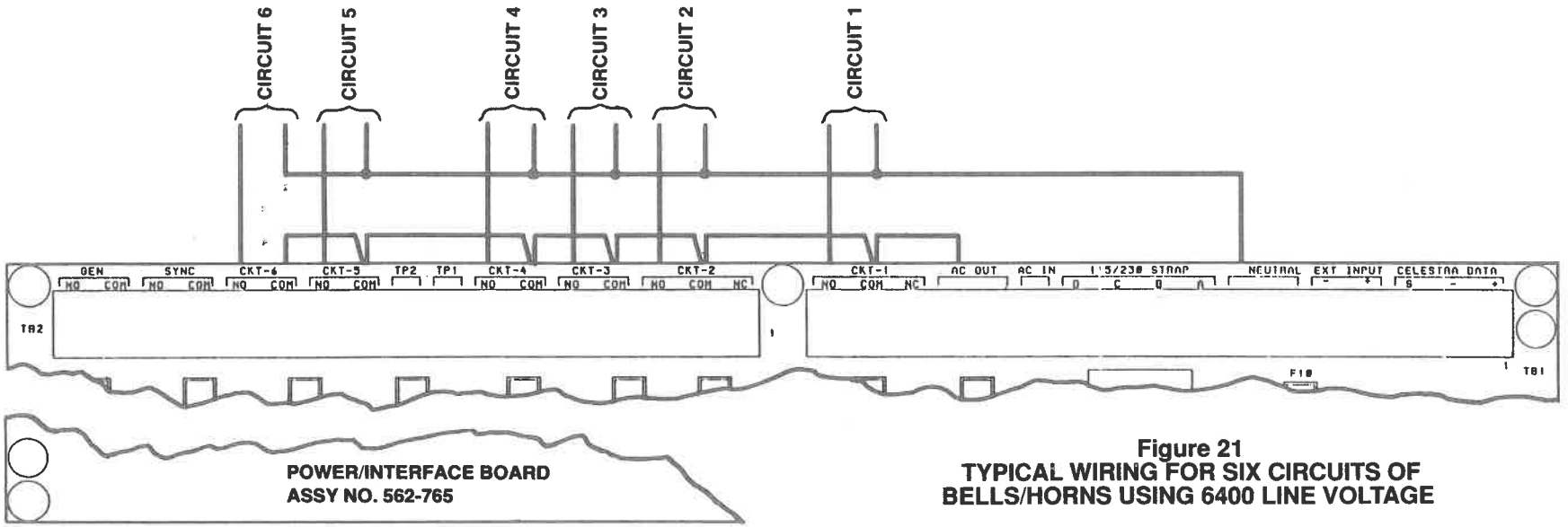


Figure 21
TYPICAL WIRING FOR SIX CIRCUITS OF BELLS/HORNS USING 6400 LINE VOLTAGE

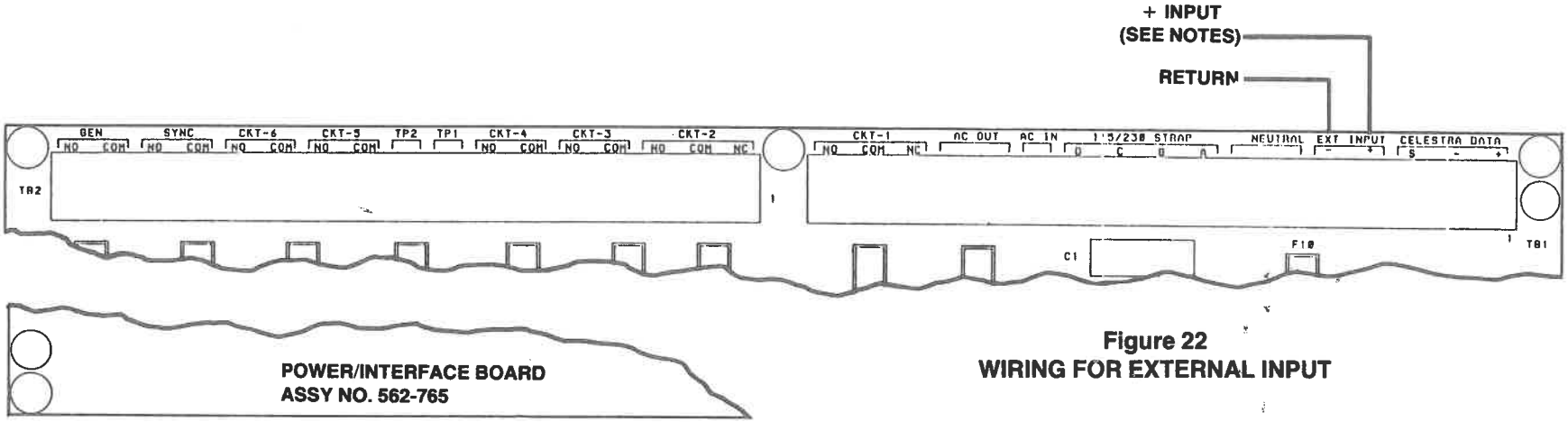


Figure 22
WIRING FOR EXTERNAL INPUT

NOTES: 1. External input voltage is 24 volts AC or DC.

2. The external input is usually from an external master clock. When the TCC receives the external input, its second will reset to zero. (If the TCC reads from 1 to 29 seconds, *only* the seconds reset to zero. If the TCC reads from 30 to 59 seconds, the seconds are reset to zero *and* the minutes are advanced by one minute.)

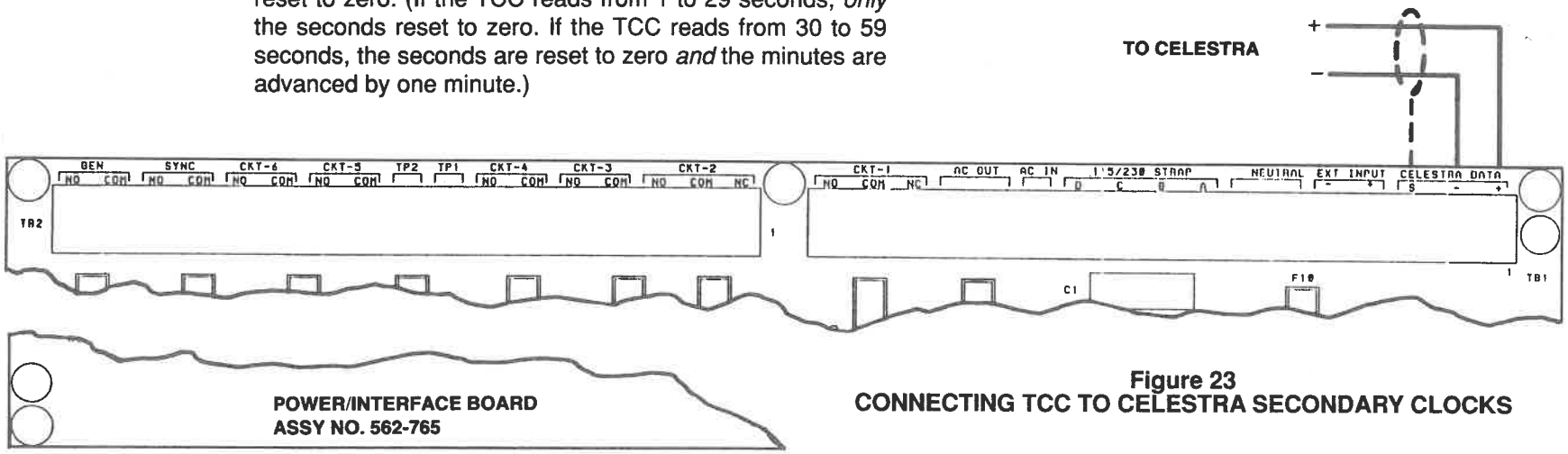


Figure 23
CONNECTING TCC TO CELESTRA SECONDARY CLOCKS

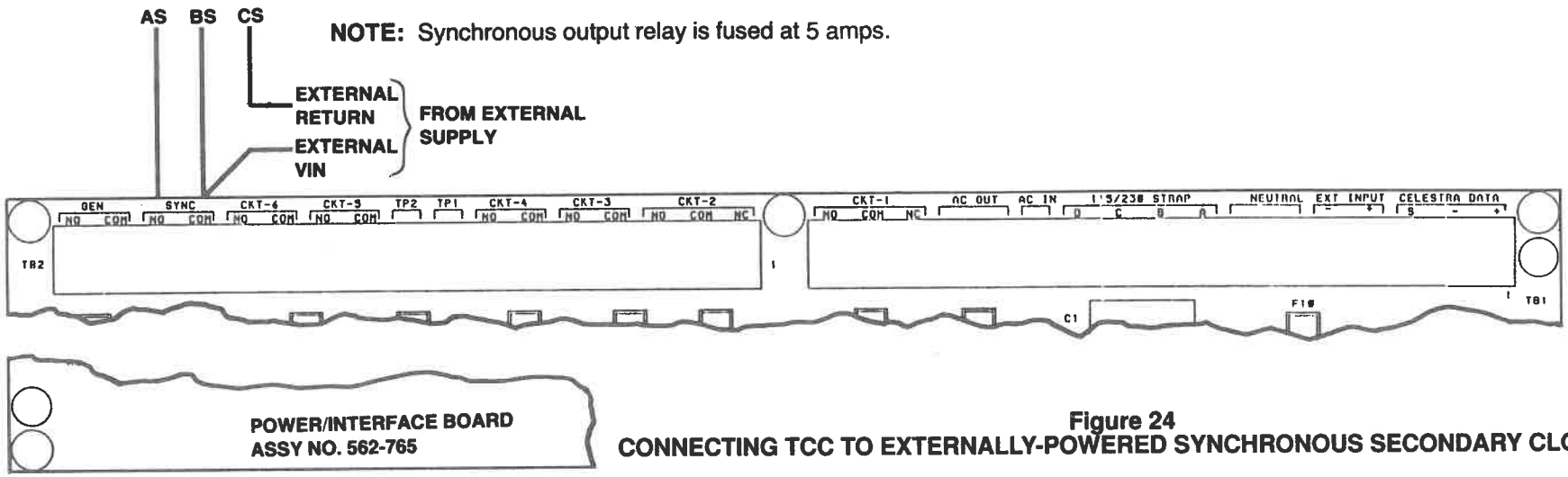


Figure 24
CONNECTING TCC TO EXTERNALLY-POWERED SYNCHRONOUS SECONDARY CLOCKS

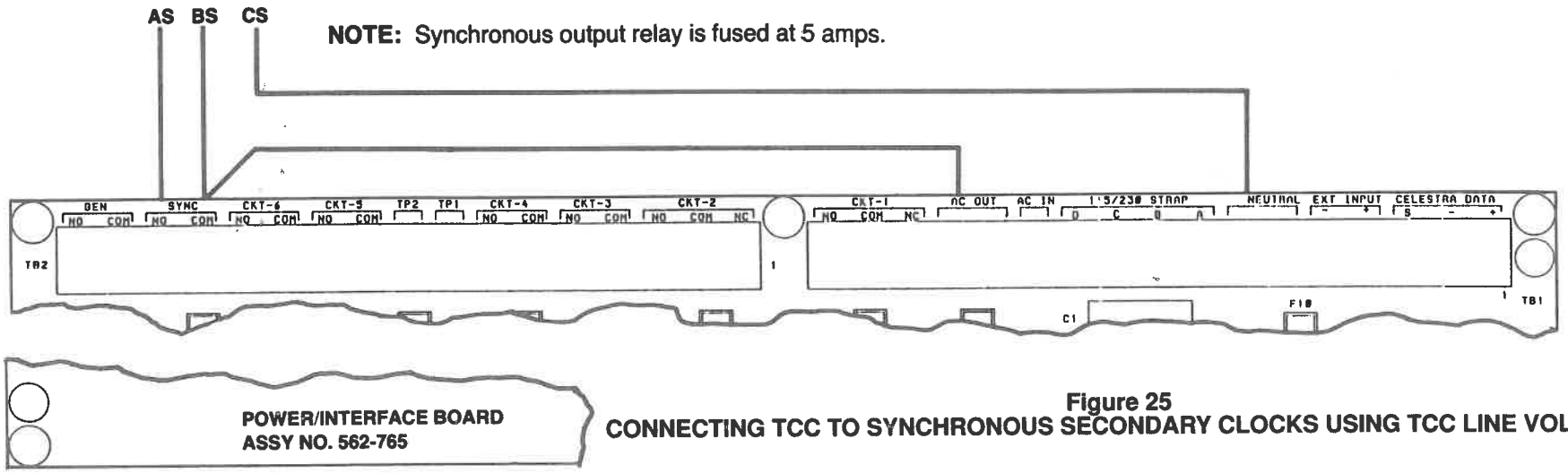


Figure 25
CONNECTING TCC TO SYNCHRONOUS SECONDARY CLOCKS USING TCC LINE VOLTAGE

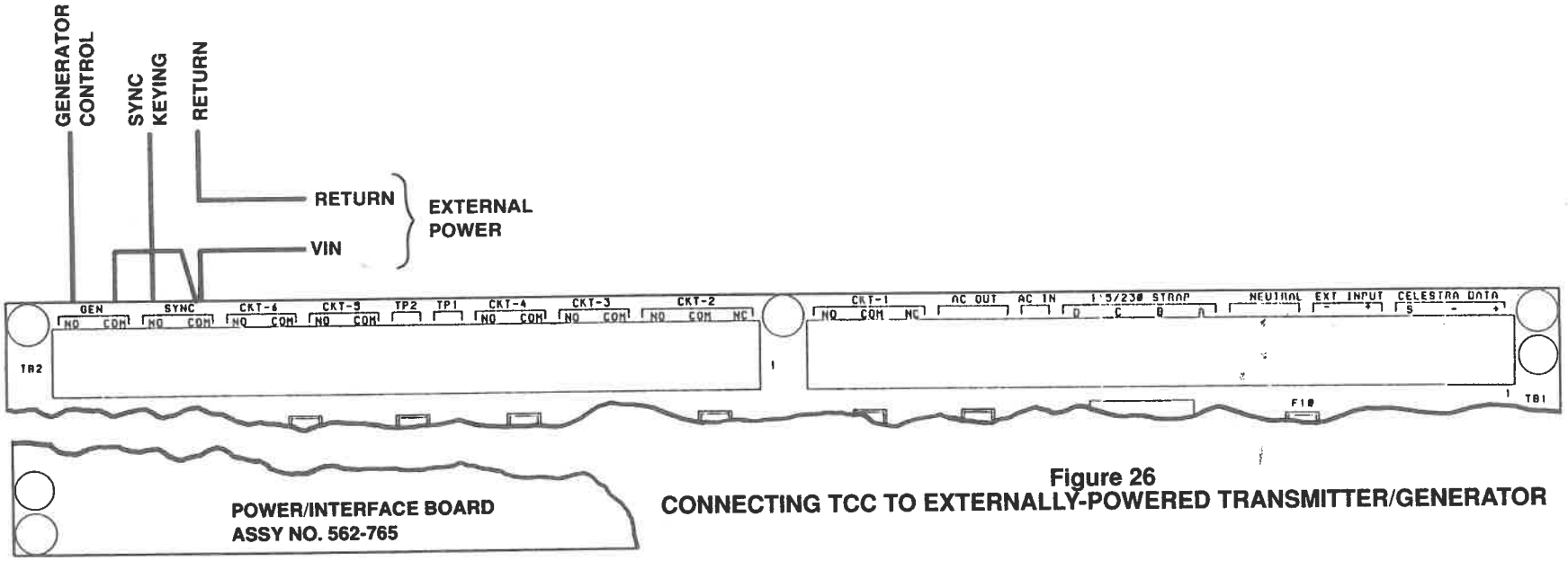


Figure 26
CONNECTING TCC TO EXTERNALLY-POWERED TRANSMITTER/GENERATOR

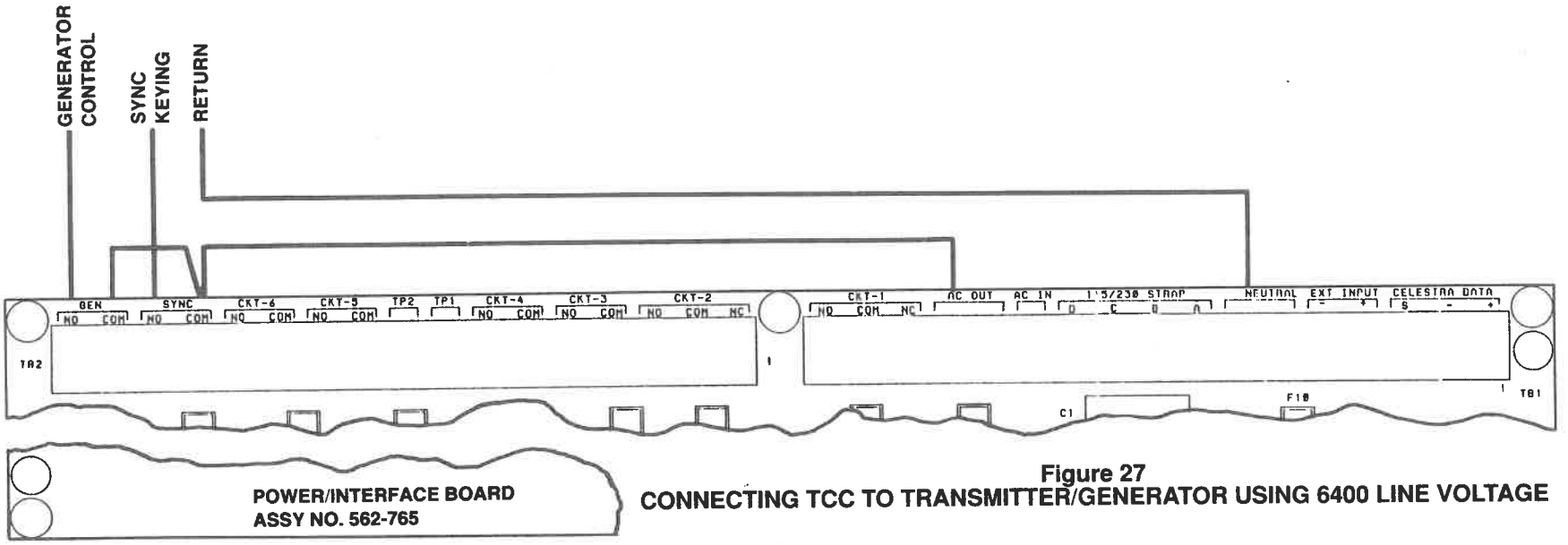


Figure 27
CONNECTING TCC TO TRANSMITTER/GENERATOR USING 6400 LINE VOLTAGE

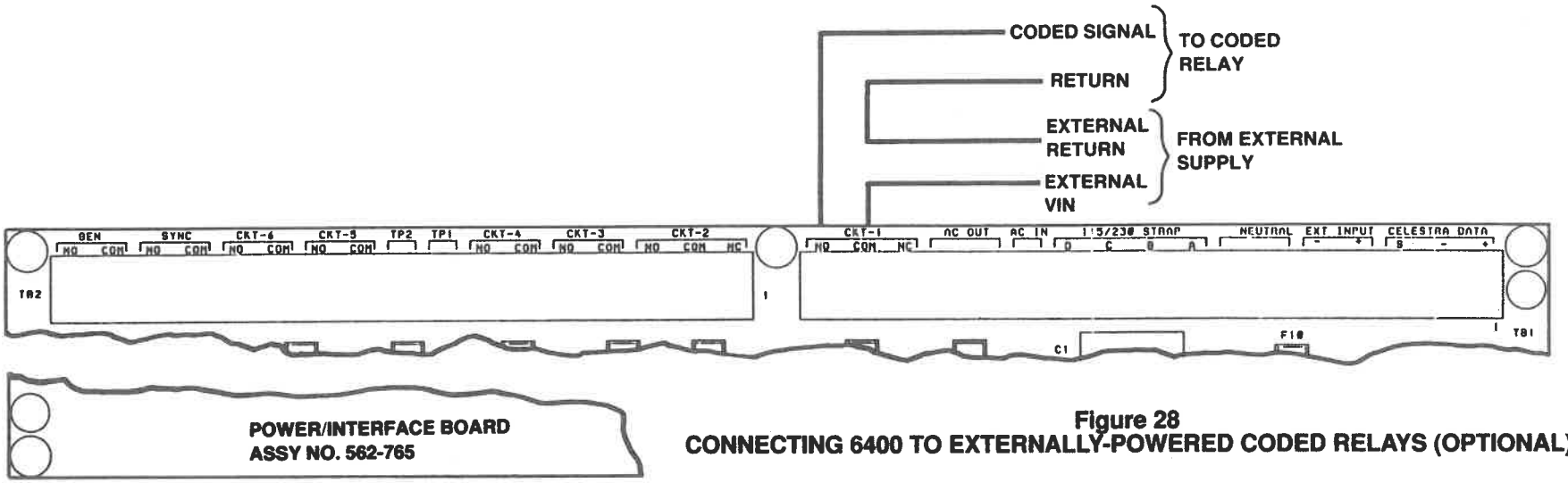


Figure 28
CONNECTING 6400 TO EXTERNALLY-POWERED CODED RELAYS (OPTIONAL)

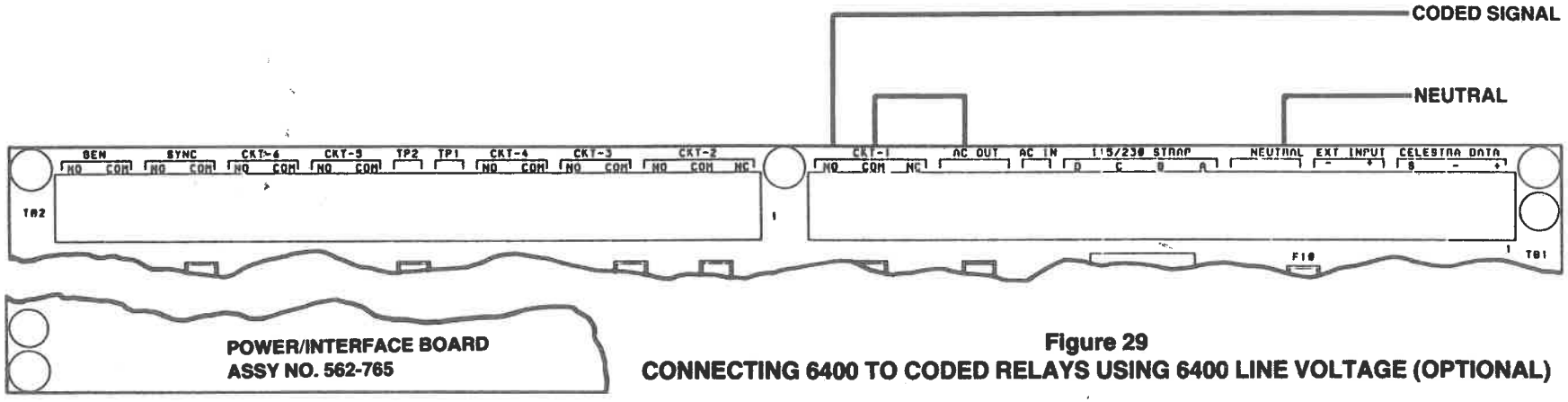


Figure 29
CONNECTING 6400 TO CODED RELAYS USING 6400 LINE VOLTAGE (OPTIONAL)

Connections to Impulse Interface Board

The Impulse Interface Board (Figure 30) is located at the rear of the TCC's box. To gain access to this board, remove the four screws from the front panel, and gently pull the panel away from its box. (It is not necessary to disconnect the ribbon cable.) This board is used in conjunction with either a Coded/Impulse Board or an Impulse Board. Connections are made to the Impulse Interface Board as follows in Figures 31 through 39:

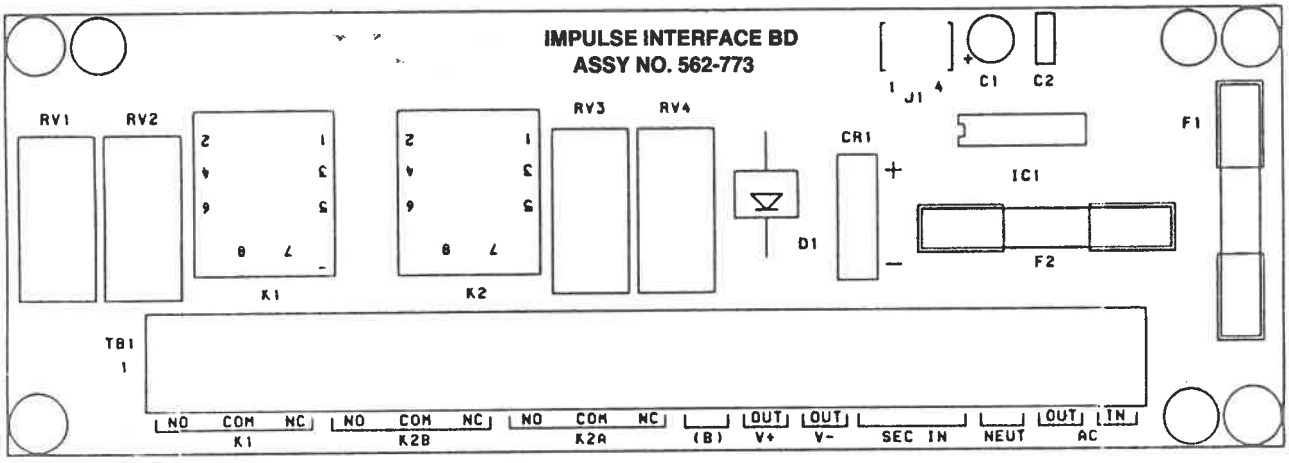
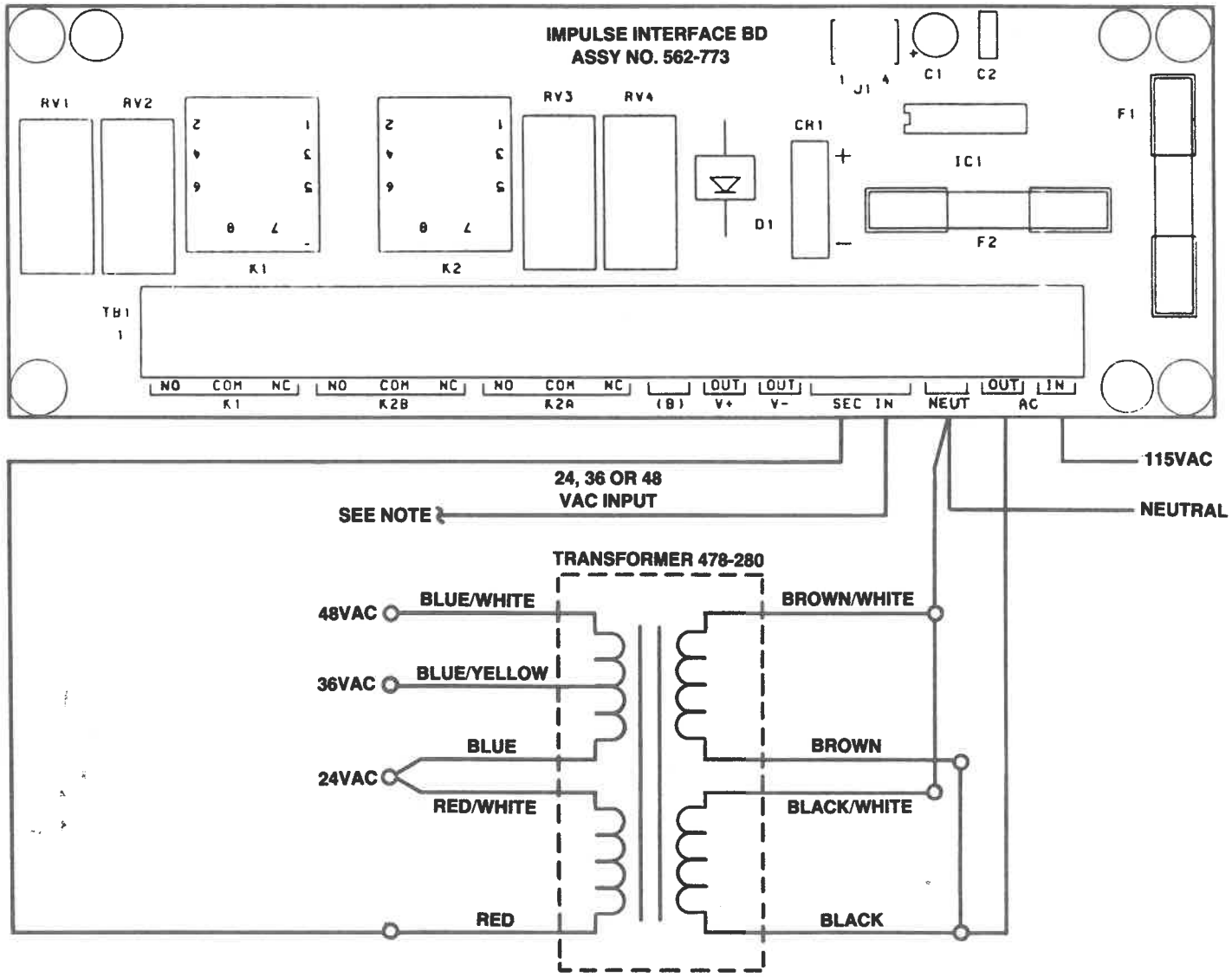
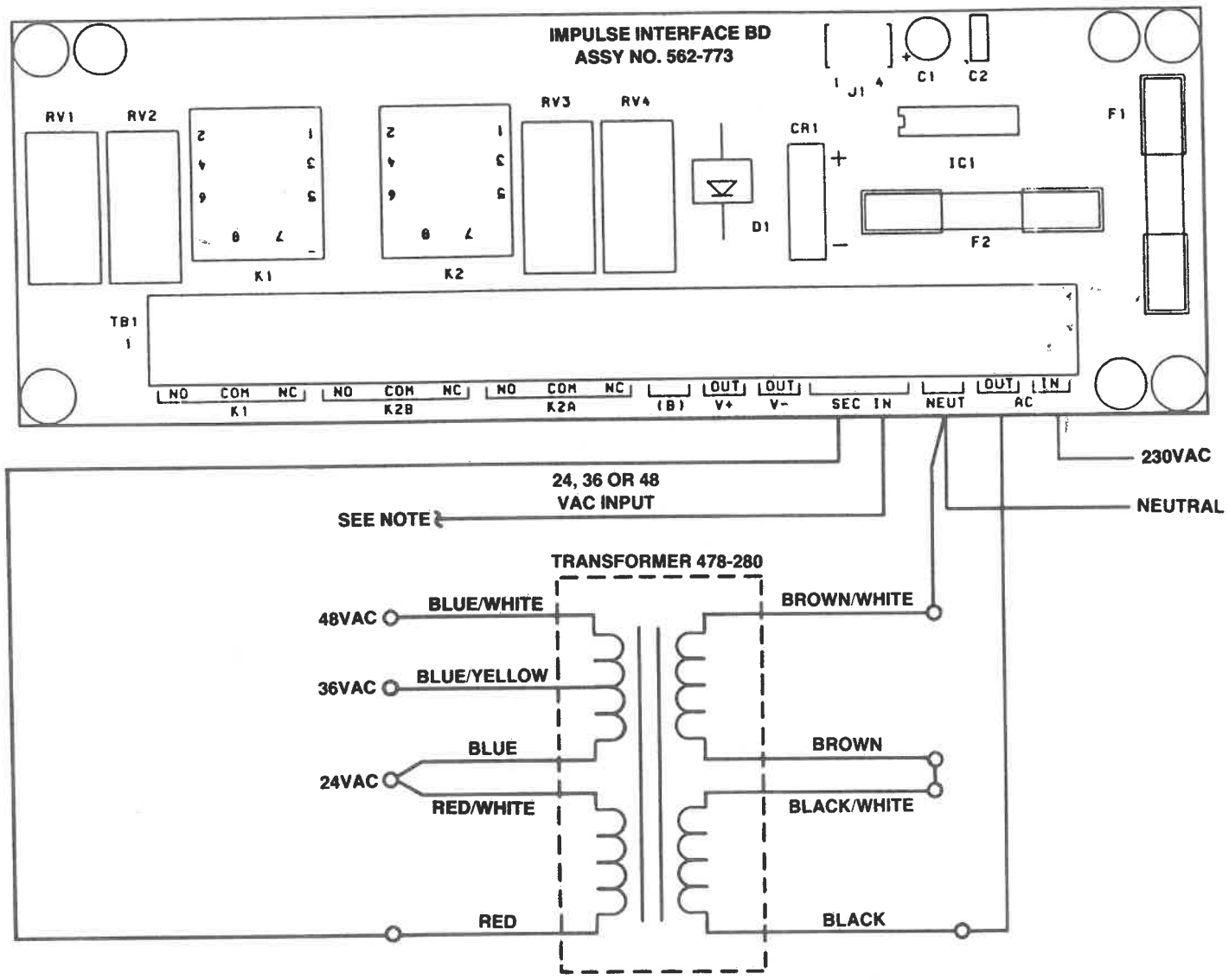


Figure 30
IMPULSE INTERFACE BOARD



NOTE: Connect desired input (24, 36 or 48VAC) to the "SEC IN" terminals.

Figure 31
IMPULSE POWER SUPPLY WIRING 115VAC (OPTIONAL)



NOTE: Connect desired input (24, 36 or 48VAC) to the "SEC IN" terminals.

Figure 32
IMPULSE POWER SUPPLY WIRING 230VAC (OPTIONAL)

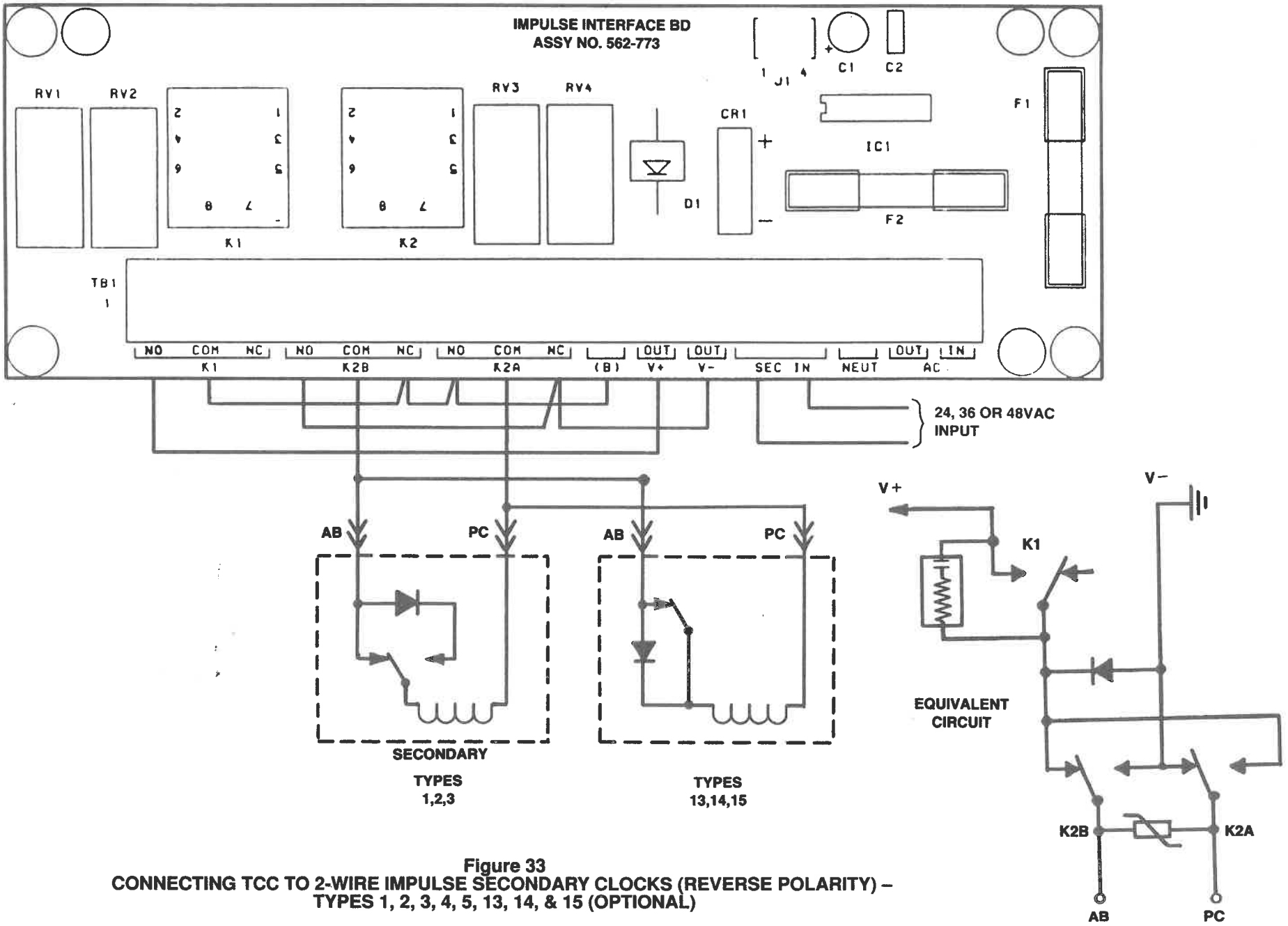


Figure 33
CONNECTING TCC TO 2-WIRE IMPULSE SECONDARY CLOCKS (REVERSE POLARITY) – TYPES 1, 2, 3, 4, 5, 13, 14, & 15 (OPTIONAL)

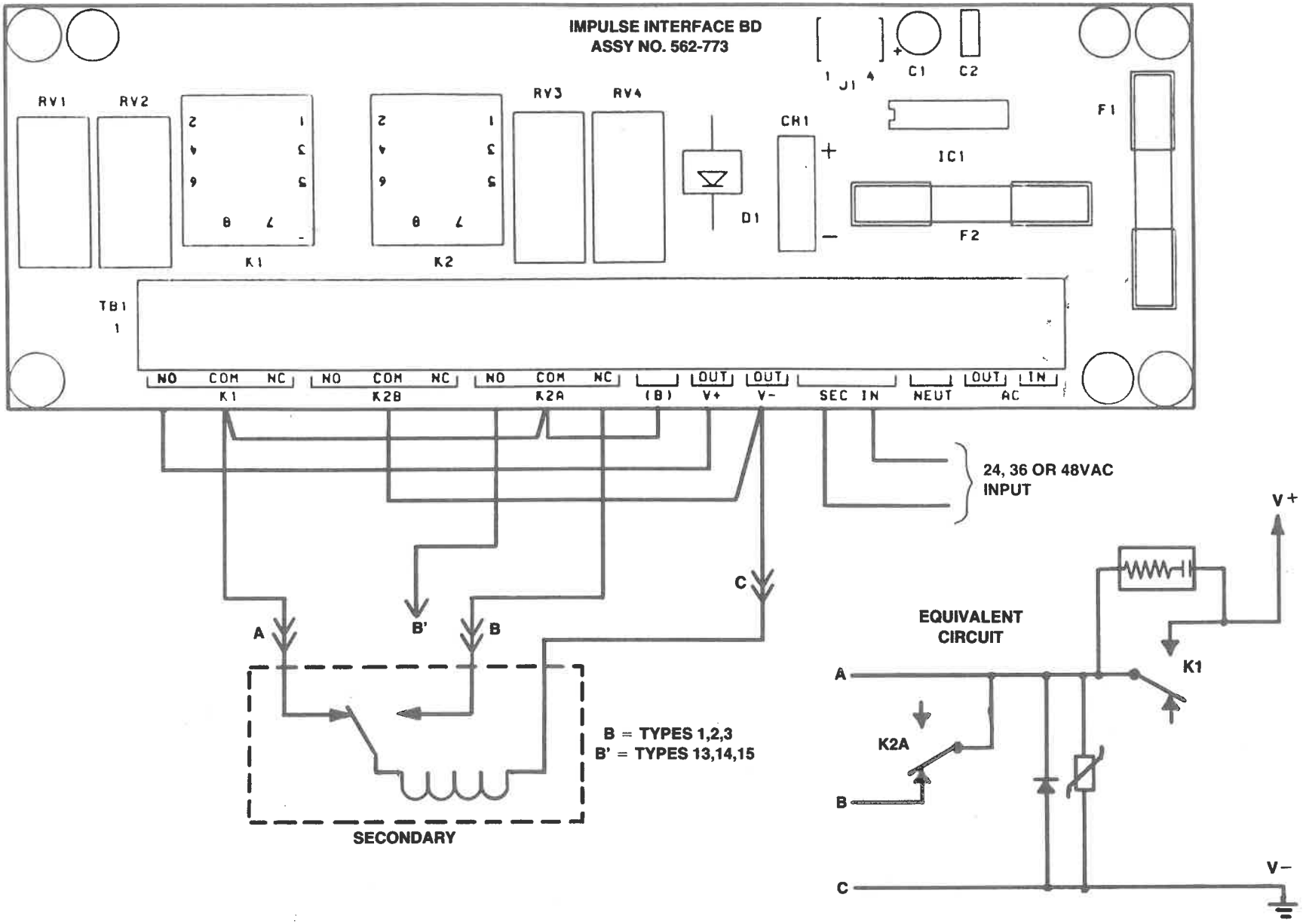


Figure 34
CONNECTING TCC TO 3-WIRE IMPULSE SECONDARY CLOCKS (B DISCONNECT) – TYPES 1, 2, 3, 13, 14, & 15 (OPTIONAL)

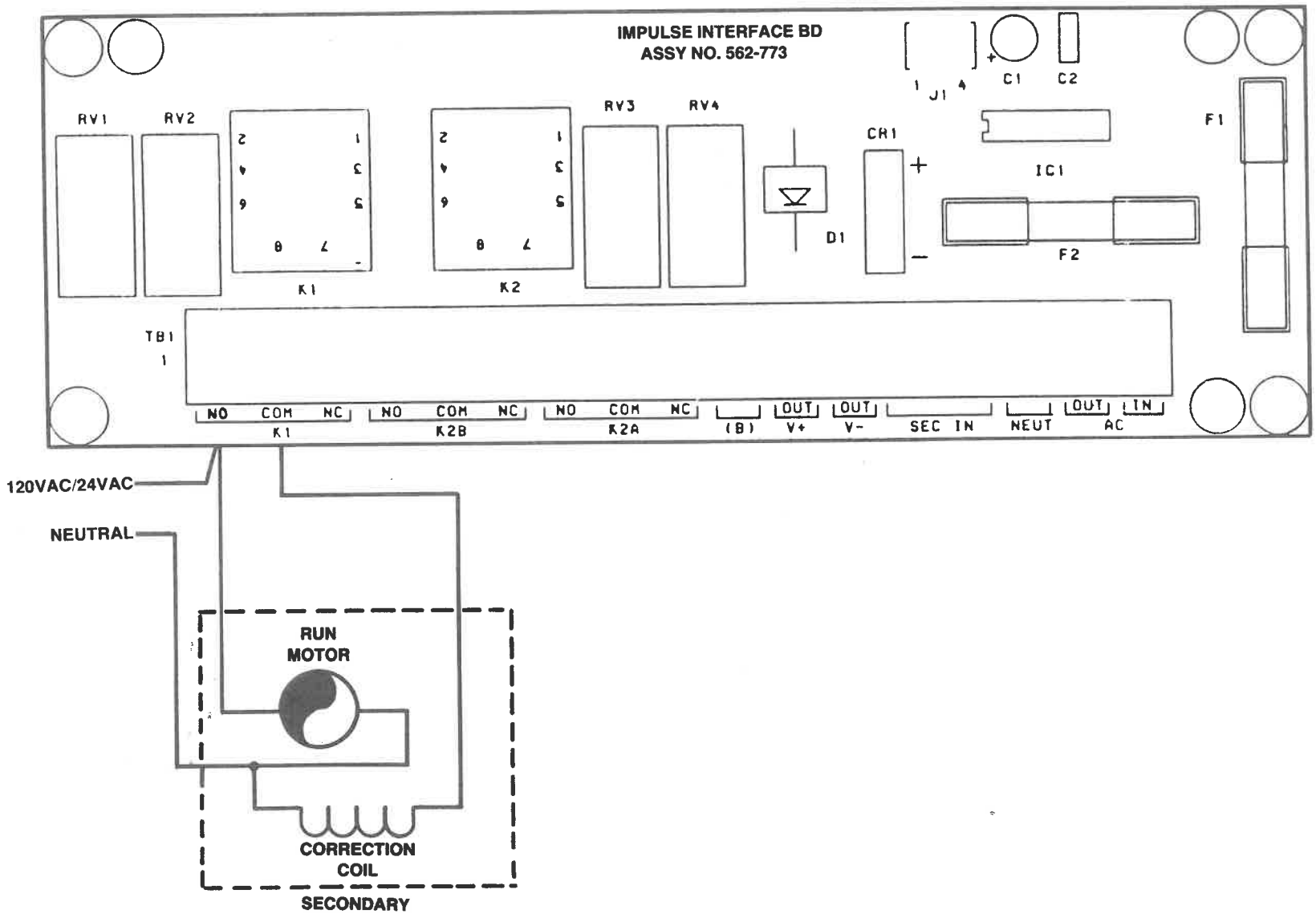


Figure 35
CONNECTING TCC TO 3-WIRE SYNCHRONOUS SECONDARY CLOCKS – TYPES 6, 7, 8, & 9 (OPTIONAL)

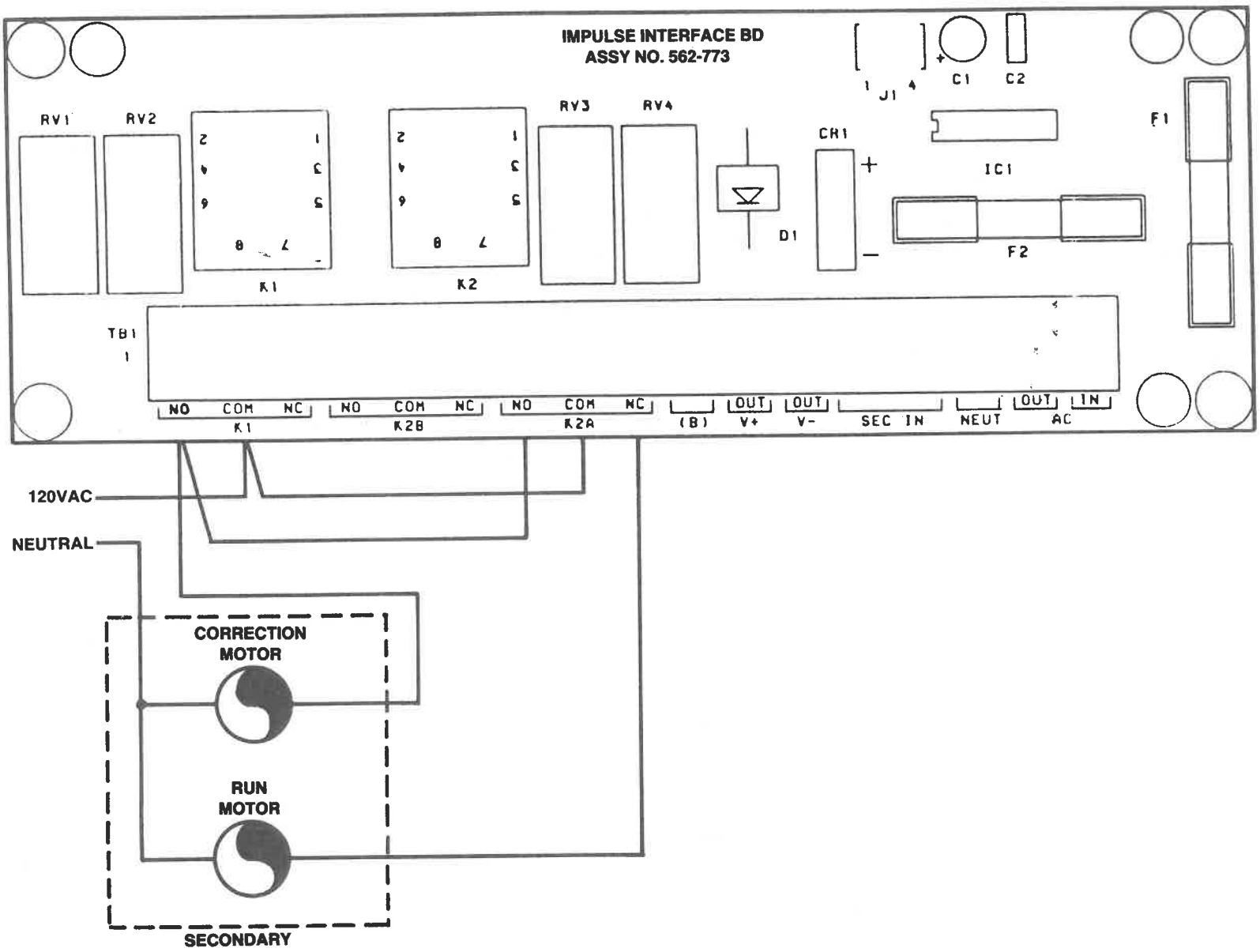


Figure 36
CONNECTING TCC TO 2 OR 3-WIRE DUAL MOTOR SECONDARY CLOCKS – TYPE 10 (OPTIONAL)

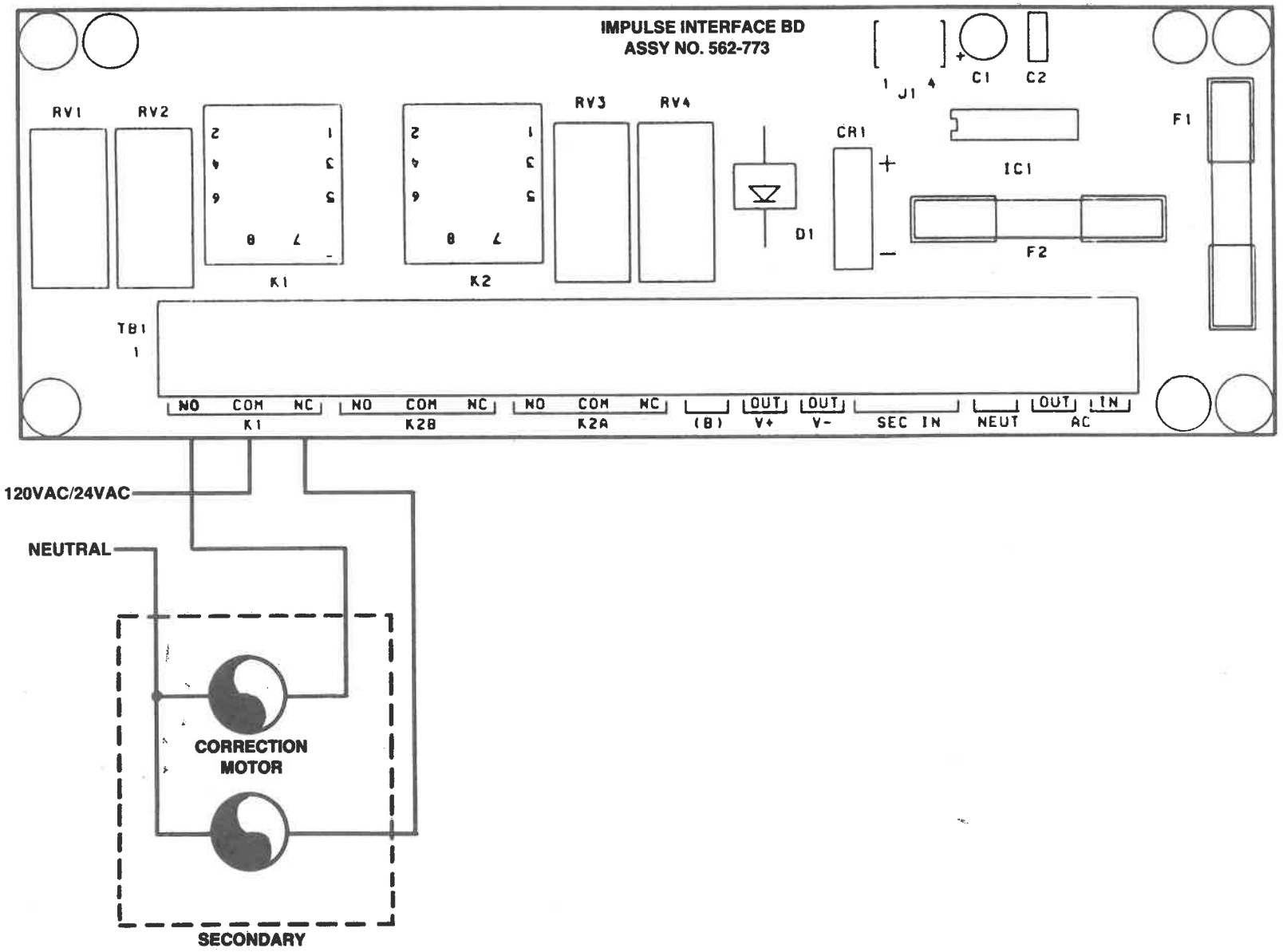


Figure 37
CONNECTING TCC TO 3-WIRE DUAL MOTOR SECONDARY CLOCKS – TYPES 11 & 12 (OPTIONAL)

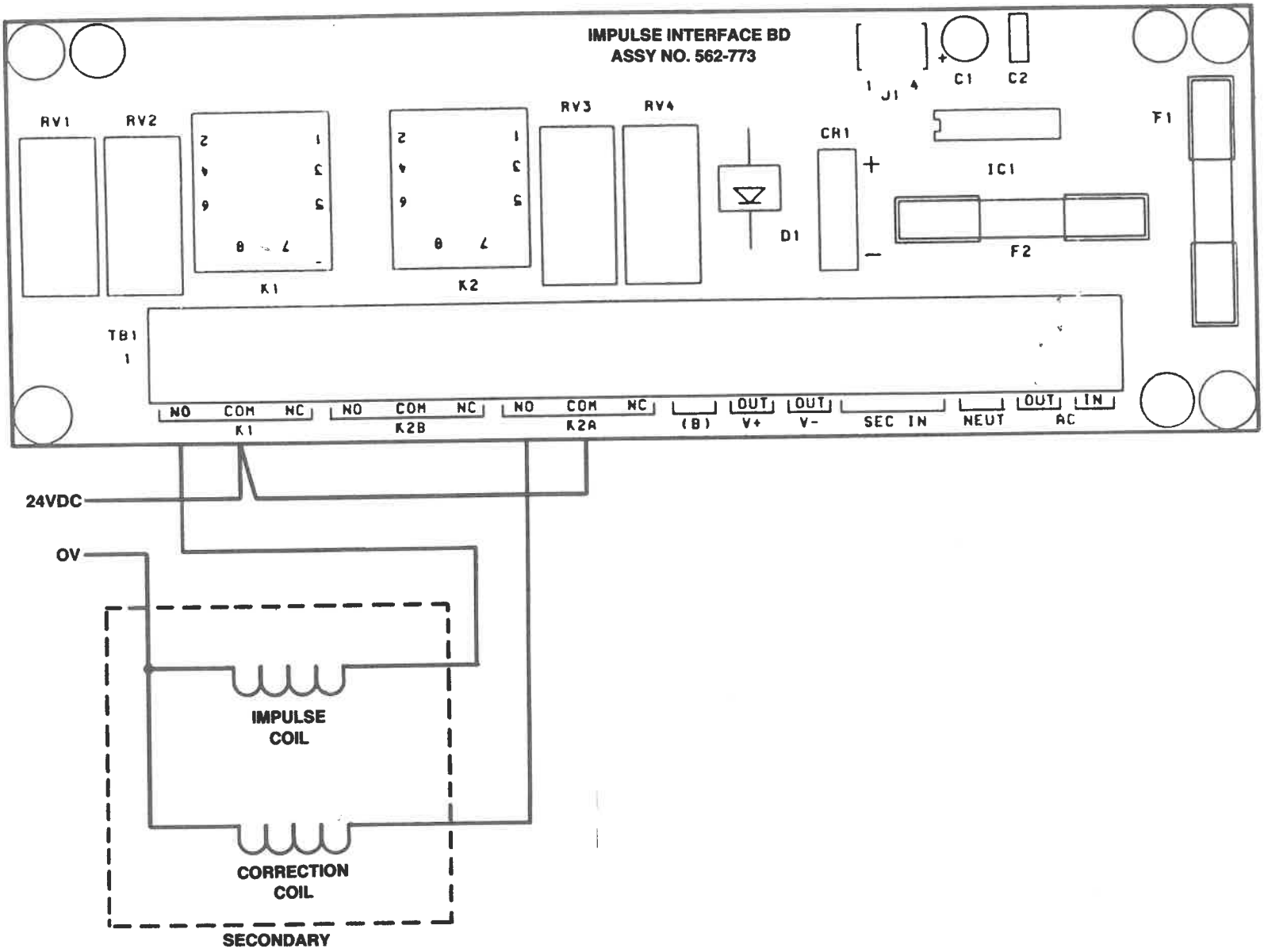


Figure 38
CONNECTING TCC TO 3-WIRE IMPULSE SECONDARY CLOCKS – TYPE 16 (OPTIONAL)

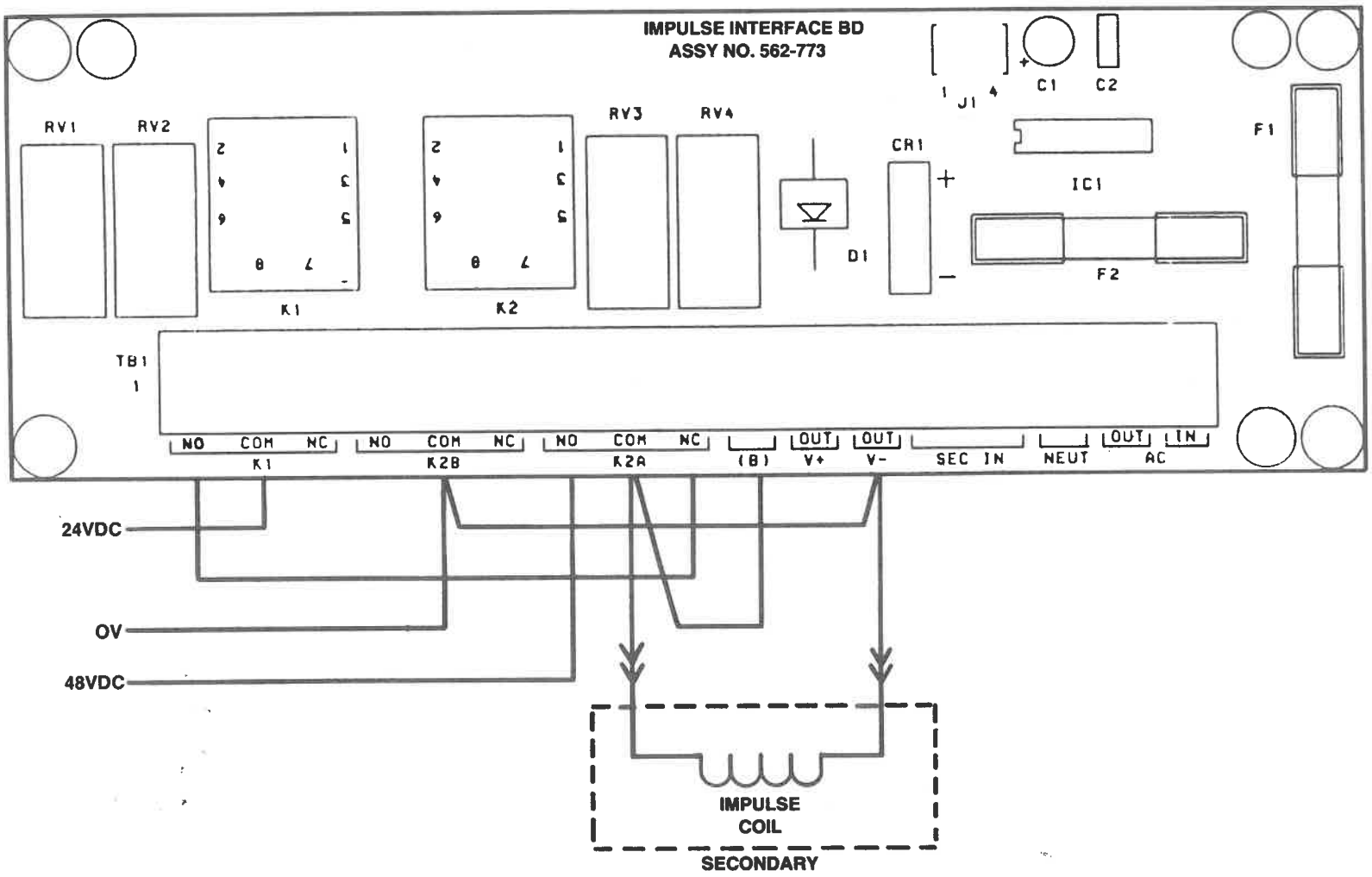
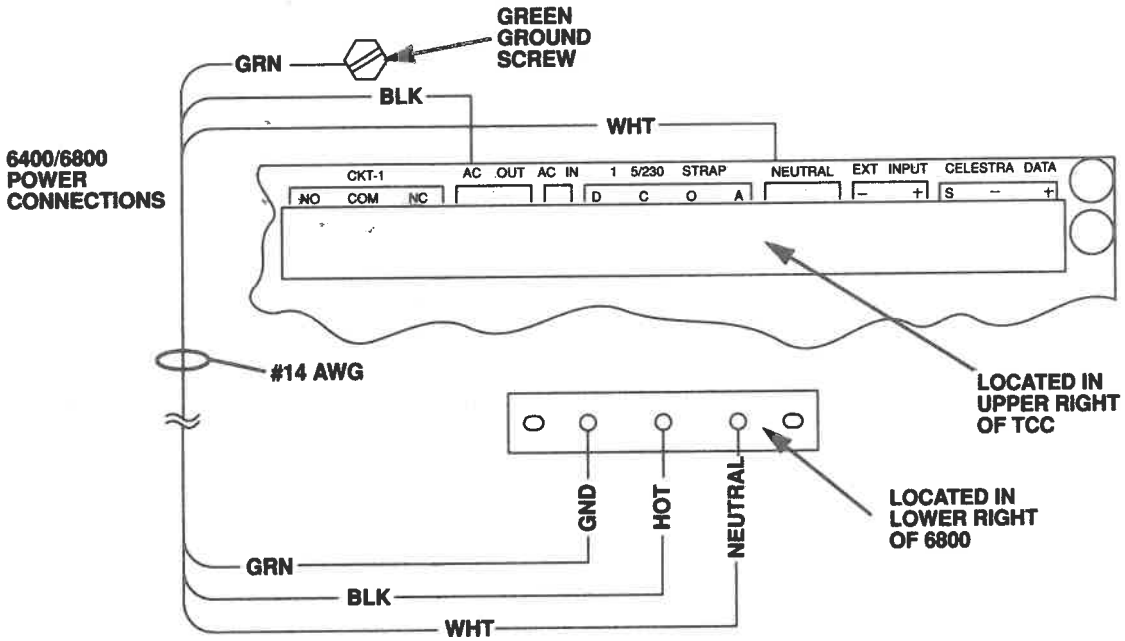


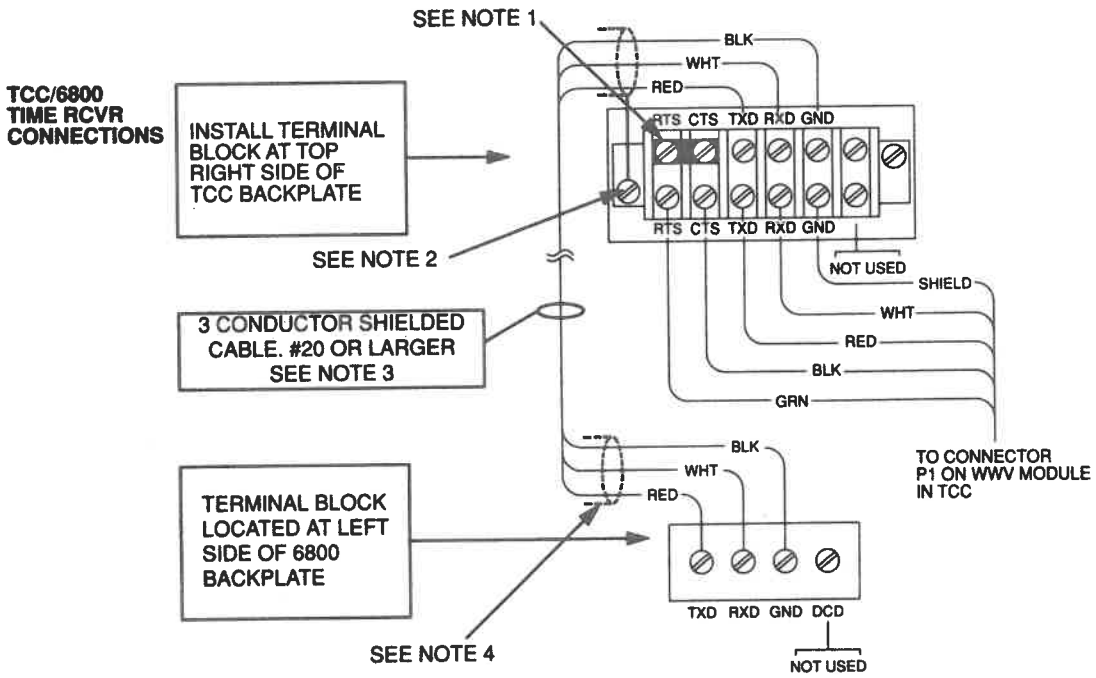
Figure 39
CONNECTING TCC TO 2-WIRE DUAL VOLTAGE IMPULSE SECONDARY CLOCKS – TYPE 17 (OPTIONAL)

Connections to 6800 Coordinated Universal Time Receiver (Optional)

NOTE: Before connecting TCC to 6800 receiver, see Appendix C, WWV Interface Board Installation Instructions.

Connect TCC to 6800 receiver as shown in Figure 40.





Notes

1. Factory-installed jumper. Remove jumper if two TCCs and Smart Switch are involved.
2. Connect shield to terminal block mounting screw.
3. Cable length between TCC and 6800 Receiver is not to exceed 25 feet.
4. Insulate shield from ground at 6800 Receiver.

Figure 40
CONNECTIONS TO 6800 COORDINATED UNIVERSAL TIME RECEIVER (OPTIONAL)

Connection to Extended Battery (Optional)

1. Remove black pin jumper P4 (166-157) on CPU Board 2 (see Figure 1 on page 5).
2. Clip off Connector Pin No. P4-4 on CPU Board 2.
3. Remove adhesive backing from Back-up Battery (112-116) and attach Battery onto CPU Board 2 (location of battery attachment is upper left-corner, between IC18 and P5).
4. Attach connector in keyed position.

Final Checkout

1. Apply AC power to the unit.
   - All arrows and segments on the TCC's display will flash for one second. The display then continues flashing, but shows a running time which starts from 00:00 (midnight) on Sunday.
2. (If desired) Increase or decrease the display's contrast by adjusting (turning the knob on) the "LCD CONTRAST" potentiometer (see Figure 1 on page 5).
   - The LCD CONTRAST potentiometer is located at R16 on CPU Board 1.

SECTION 3

OPERATING MANUAL OVERRIDE SWITCHES (STANDARD EQUIPMENT)

Operating Manual Override Switch(es) for ON/OFF and PULSE Type Events (6400 only)

ON — Placing switch in ON position turns selected circuit ON and keeps the circuit ON indefinitely. Placing switch in ON position and then immediately placing switch in AUTO position turns selected circuit ON until next OFF programmed event turns the circuit OFF.

AUTO — A. Keeping switch in AUTO position allows the 6400's stored program to control the selected circuit.

B. Placing switch in AUTO position (after placing switch in OFF or ON position) keeps selected circuit ON or OFF until a programmed event changes its condition.

OFF — Placing switch in OFF position turns selected circuit OFF and keeps the circuit OFF indefinitely. Placing switch in OFF position and then immediately placing switch in AUTO position turns selected circuit OFF until next ON programmed event turns the circuit ON.

Operating Manual Override Switch(es) for DELAY Events (6400 only)

ON — Placing switch in ON position turns selected circuit ON and keeps the circuit ON until next OFF delay event turns the circuit OFF. A delay event in progress is aborted while switch is placed in ON position.

AUTO — Placing switch in AUTO position initiates next delay event programmed for the selected circuit.

OFF — Placing switch in OFF position turns selected circuit OFF and keeps the circuit OFF. A delay event in progress is aborted while switch is placed in OFF position.

Operating Manual Override Switch(es) for SYNCHRONOUS Output

ON — Placing switch in ON position outputs a synchronous correction once a minute – from 54 to 02 seconds.

AUTO — Placing switch up or down to AUTO position initiates normal synchronous clock correction signals (see Figure 41 below).

OFF — Placing switch in OFF position disables normal synchronous clock correction signals.

Synchronous Clock Systems	8-Second Correction	14-Second Correction
12-Hour	Every hour (except at 5:57:54 AM & PM) from the 57th minute 54th second to the 58th minute 02 second	At 5:57:54 AM & PM to 5:58:08 AM & PM
24-Hour	Every hour (except at 5:57:54 AM) from the 57th minute 54th second to the 58th minute 02 second	At 5:57:54 AM to 5:58:08 AM

Figure 41
NORMAL SYNCHRONOUS CLOCK CORRECTION SIGNALS

Operating Manual Override Switch(es) for GENERATOR Output

ON — Placing switch in ON position turns generator motor ON.
AUTO — Placing switch in AUTO position allows stored program to turn generator motor ON and OFF.
Note: Generator motor comes on 60 seconds before a programmed event occurs.
OFF — Placing switch in OFF position disables generator motor control.

Operating Manual Override Switch(es) for SERIAL BCD Output

ON — Placing switch in ON position outputs serial data (correction) once a second.
OFF — Placing switch in OFF position disables correction output.

OPERATING MANUAL OVERRIDE SWITCHES (OPTIONAL EQUIPMENT)

Operating Manual Override Switch (CIRCUIT 1) for REMOTE RELAYS

See **6400 Programming Instructions** Publication, MC6-41-100 (574-404) for detailed information.

Operating Manual Override Switch for SECONDARY CLOCK Output

AUTO — Placing switch in AUTO position enables normal timings.
OFF — Placing switch in OFF position disables normal timings.
ADVANCE — Placing switch in ADVANCE position advances secondary clocks as follows:

A. For Simplex impulse secondary clocks below –

- TYPE 1 – 59TH MINUTE REFERENCE
- TYPE 2 – 58TH MINUTE REFERENCE
- TYPE 3 – 44TH MINUTE REFERENCE

- clocks advance according to the settings of DIP switches 8 & 9 (SW1) on the Coded/Impulse or Impulse Board. (Clocks stop advancing at correction reference – 59th, 58th, or 44th minute). See Figure 12.

B. For the secondary clocks below –

- TYPE 6 – HONEYWELL, FARADAY (1300 SERIES), CINCINNATI (D SYNCHRONOUS)
- TYPE 7 – NATIONAL TIME (HOURLY)
- TYPE 8 – NATIONAL TIME (12-HOUR CORRECTION)
- TYPE 9 – STROMBERG (SYNCHRONOUS, 56TH MINUTE REFERENCE, ELECTRONIC)
- TYPE 10 – STANDARD ELECTRIC TIME (FMT-DUAL MOTOR), COUCH (C452014 THROUGH C452019 AND C452133 THROUGH C452145)
- TYPE 11 – SIMPLEX 45TH MINUTE REFERENCE (DUAL MOTOR)
- TYPE 12 – SIMPLEX 59TH MINUTE REFERENCE (DUAL MOTOR)

- clock correction coil or motor is energized and remains energized until switch is placed in AUTO or MAN position.

C. For other impulse secondary clocks, see Figure 42.

CLOCK TYPE(S)	ADVANCE RATE
4 – 1-MINUTE REVERSE POLARITY	1 MINUTE EVERY 3 SECONDS (1 SECOND ON, 2 SECONDS OFF)
5 – ½-MINUTE REVERSE POLARITY	½ MINUTE EVERY 3 SECONDS (1 SECOND ON, 2 SECONDS OFF)
13,14,15 – CINCINNATI D6 (12-HOUR CORRECTION), CINCINNATI D3 & STROMBERG (58TH MINUTE REFERENCE)	1 MINUTE EVERY 2 SECONDS (1 SECOND ON, 1 SECOND OFF)
16,17 – STANDARD ELECTRIC TIME (AR2A & AR3A, 60TH MINUTE REFERENCE & AR2, 59TH MINUTE REFERENCE)	1 MINUTE EVERY 4 SECONDS (2 SECONDS ON, 2 SECONDS OFF)

Figure 42
ADVANCE RATES (IMPULSE SECONDARY CLOCKS)

APPENDIX A
GENERAL MOUNTING INSTRUCTIONS

CAUTION

TO AVOID DAMAGING TCC PC BOARDS, NEVER PLUG OR UNPLUG PC BOARD CONNECTORS WITH AC POWER ON.

See Figure 43 for Steps 1 through 8.

1. Mount back box (A) to wall using appropriate fasteners.

NOTE: Back box may be surface or semi-flush mounted. If semi-flush mounted, a separate package containing a trimplate was shipped with the unit.

2. Mount backplate (B) to rear of back box using eight screws and lockwashers.
3. Perform pre-power adjustments and installation wiring per Sections 1 and 2 of this publication.
4. Slide four #10 retaining nuts (C) onto lip of back box — one at each hole.
5. Attach retainer panel (D) to back box by inserting retainer panel hinges (E) inside back box slots (F).
6. Insert two #10 screws through retainer panel into retaining nuts at bottom of back box. Begin tightening screws but do not tighten securely.
7. Connect restriction wire (G) to studs on backplate and retainer panel using one #6 nut and #6 lockwasher for each stud.
8. Connect green ground strap (H) to studs on backplate and retainer panel using one #6 nut and #6 lockwasher for each stud.

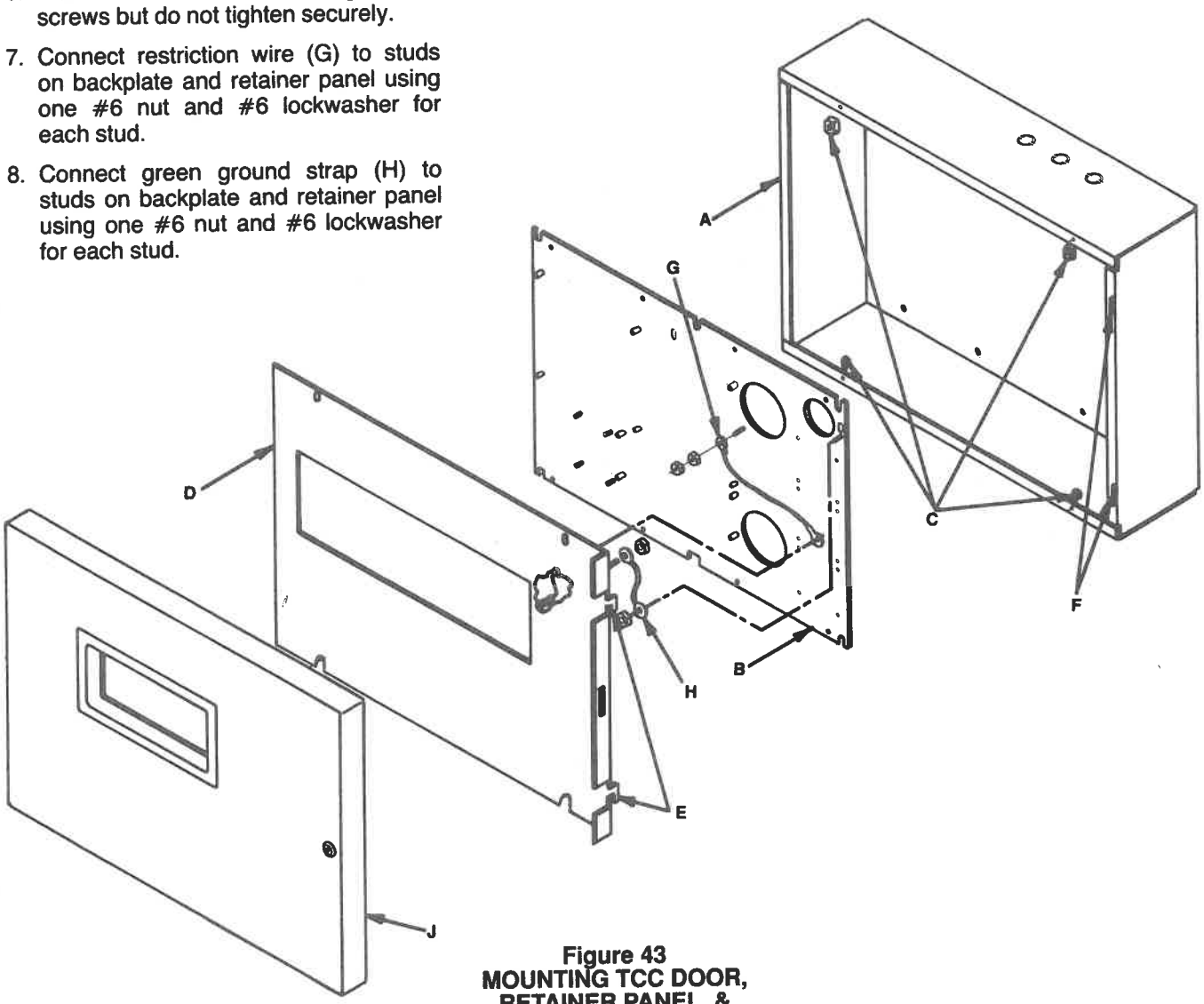


Figure 43
MOUNTING TCC DOOR, RETAINER PANEL, & MOUNTING PLATE TO BACK BOX

See Figure 44 for Step 9.

9. Connect CPU Board's P7 Connector Cable to Power/Interface Board at P1 Header. When connecting P7 Connector Cable, ensure that all pins in P1 Header align with P7 Cable Socket.

CAUTION: TO AVOID DAMAGING TCC PC BOARDS, PRECISELY FOLLOW STEP 9 AND NEVER PLUG OR UNPLUG PC BOARD CONNECTORS WITH AC POWER ON.

See Figure 43 for Steps 10 through 14.

10. Slide retainer panel down on two screws previously installed at bottom of back box.
11. Insert remaining two screws through retainer panel into retaining nuts at top of back box. Securely tighten these screws and also screws at bottom of box.
12. Attach door (J) to back box by sliding door hinges over pin hinges on left side of back box.
13. Apply AC power.
14. Program TCC as necessary.
15. Lock door.

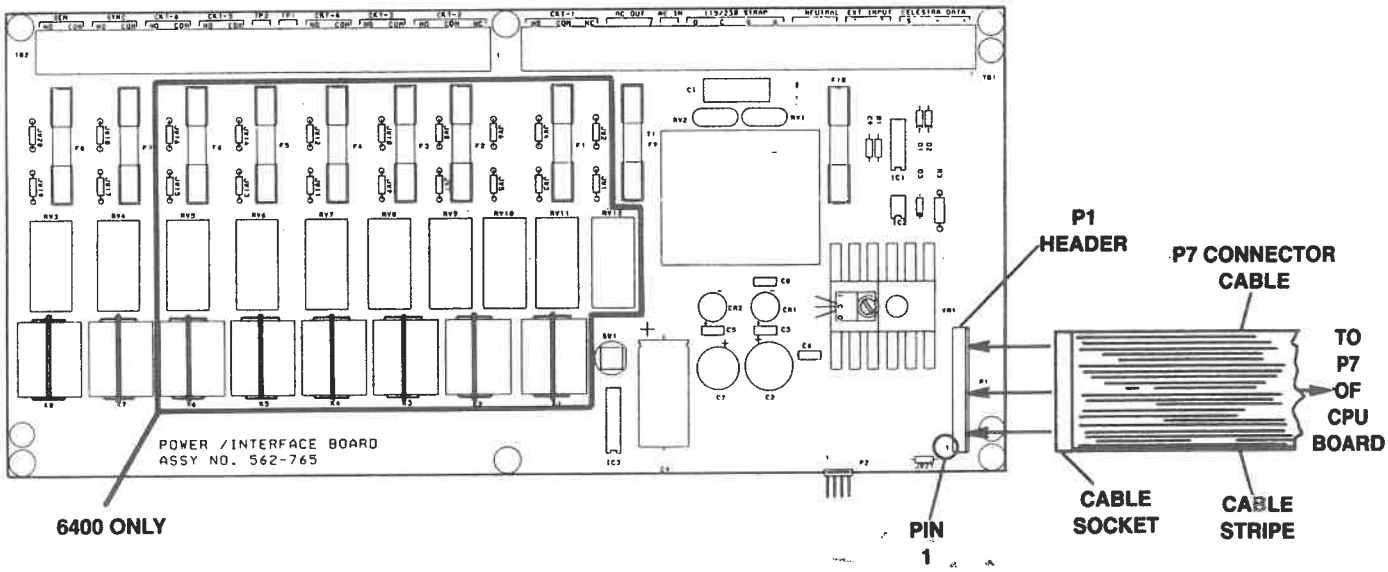


Figure 44
CONNECTING CPU TO
POWER/INTERFACE BOARD

APPENDIX B

SPECIAL INSTRUCTIONS FOR RACK-MOUNT MODEL (6400 ONLY)

General Notes

1. For frame mounting, attach the four #10 screws supplied by Simplex (see Step 9 below).

2. For slide mounting, the following hardware (or equivalent) is recommended (see Mounting Instructions - Slides & Cable Carrier below and instructions supplied with slides and cable carrier):

   A. 2 — Slides (Vendor Part No. CC-3700)

   VENDOR:

   Chassis Trak Electronic Slide Mechanisms
   Division of General Devices Electronic Hardware Manufacturers
   P.O. Box 39100
   Indianapolis, Indiana 46239
   (317) 897-7000

   NOTE: Order slides that are two inches shorter than rack depth, i.e., if rack depth is 18 inches, order 16-inch slides.

   B. 1 — Cable Carrier (Vendor Part No. D-329)

   VENDOR:

   Vent Rak Electronic Cabinetry
   (also a Division of General Devices — see address above)

   NOTE: The above cable carrier must be used to supply strain relief for all incoming wires to the 6400. When attaching cable to the cable carrier, use cable ties which are supplied with 6400.

Mounting Instructions — Slides & Cable Carrier

NOTE: See Figure 45 for Steps 1 through 6.

1. Remove 6400 top cover (A) by removing the four No. 6 screws (B) — two on each side.
2. Using hardware supplied with slides, attach one inner mounting rail (C) to either side of 6400 chassis (D).

NOTE: Locking mechanism (E) on inner mounting rail should be positioned towards rear of chassis.

3. Repeat Step 2 for remaining inner mounting rail.
4. Using hardware supplied with rear mounting bracket (F), attach one rear mounting bracket to outer mounting rail (G).
5. Repeat Step 4 for remaining rear mounting bracket and its outer mounting rail.
6. Using supplied hardware, attach outer mounting rails to rack rails (not shown).

NOTE: Ensure that rear mounting brackets are attached to rear rack rails.

7. Using supplied hardware, attach cable carrier (H) to rear rack rail and rear of 6400 chassis. See Figure 46.

NOTE: Ensure that grounding wire (J) is attached to 6400 chassis (Figure 46).

8. Replace top cover by replacing four screws (B). See Figure 45.
9. Attach four # 10 screws (K) to 6400's front brackets, two on each side, to keep 6400 from sliding out of its rack (Figure 45).

NOTE: Four #10 screws (K) are supplied with 6400.

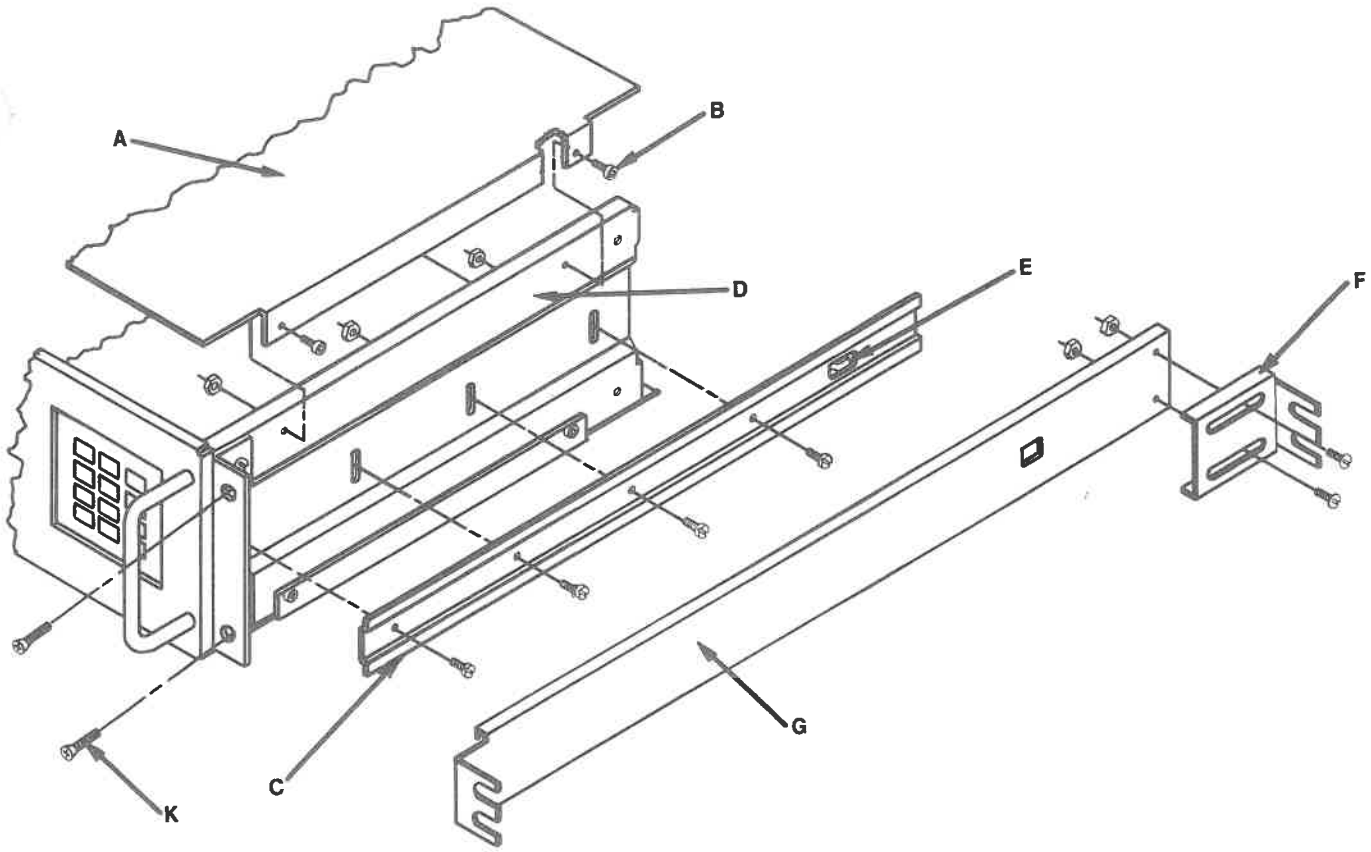


Figure 45
INSTALLING RACK-MOUNT SLIDES (6400 ONLY)

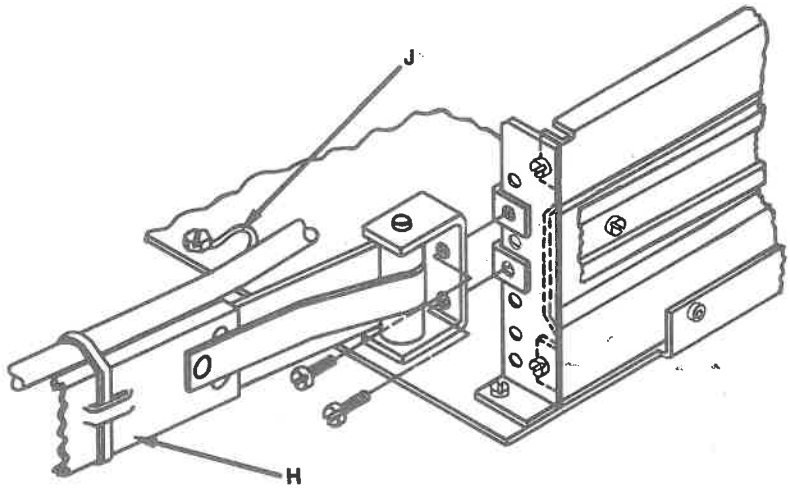


Figure 46
INSTALLING RACK-MOUNT CABLE CARRIER (6400 ONLY)

APPENDIX C

WWV INTERFACE BOARD — INSTALLATION INSTRUCTIONS

1. Disconnect AC power.

   See Figure 47 for Steps 2 through 5.

2. Using two No. 8 screws (A), attach marker strip (B) — with abbreviations RTS, CTS, TXD, RXD and GND at top — and harness assembly (C) to 6400 mounting plate (D).

3. Using four spacers (E) and four No. 6 screws (F), install WWV Interface Board (G) with its P1 connector at top of board.

4. Attach harness assembly connector (H) to P1 on the WWV Board (G).

5. Attach cable clamps (J) where necessary.

6. Reconnect AC power.

NOTE: Factory installed jumper. Remove if two TCCs and Smart Switch are involved.

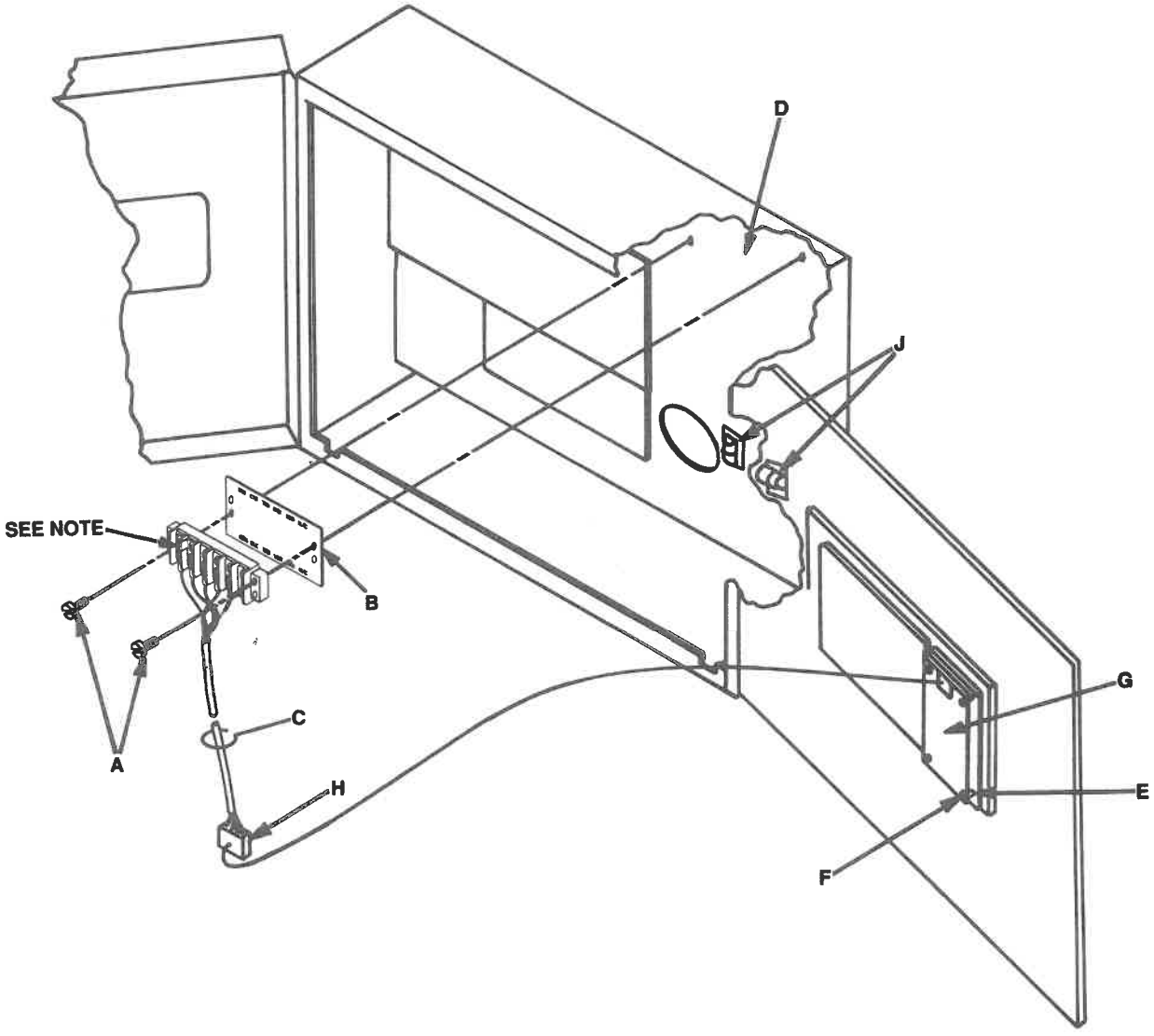


Figure 47
INSTALLING WWV INTERFACE BOARD

APPENDIX D
6351 KEYPAD OPERATION AND BASIC KEYPAD ENTRIES

INTRODUCTION

The 6351 Time Control Center (TCC) controls Simplex synchronous and BCD data (Celestra) digital secondary clocks and as an option, Simplex impulse secondary clocks as well as most competitive clock systems. The following explains keypad operation and basic keypad entries such as setting the time and day of the week, setting the date, etc. on a 6351 TCC.

KEYPAD OPERATION

General Notes

Your 6351 includes a Liquid Crystal Display (LCD) and a keypad which allows you to enter time information into the unit's memory. In addition to showing the time, the display prompts you throughout each time setting procedure by asking questions (in the form of blinking characters or symbols).

If your answer is "YES" to a question (depress the keypad's [YES] key), the 6351 accepts the information as correct and asks another question. If your answer is "NO" to a question (depress the keypad's [NO] key), the 6351 rejects the information which had been blinking and provides you with another choice.

The above continues until all questions involved in a time setting entry have been answered "YES" – whereupon the display blinks all the information which you've instructed the 6351 to accept.

When all of the information on the display is blinking, examine each piece of blinking information to make sure the entire entry is correct. If correct, press the [ENTER] key; if incorrect, press the [NO] key.

- If you press the [NO] key at this point, the 6351 will reject all of the information which it had previously accepted and instructs you to begin the entry again.

The 6351 and 6400 TCCs share the same display and keypad. Some keypad locations and LCD indications are not used in the 6351.

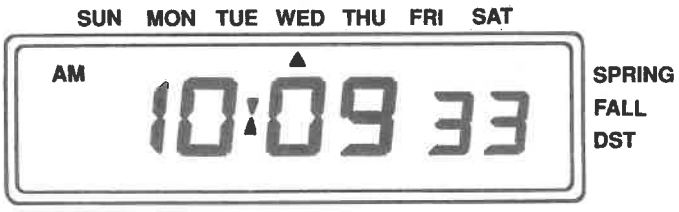


Figure 48
LCD Display

Keypad Normally Active

CPU Board's DIP switch #6 is in the ON position.

1. When the 6351's keypad is active, the LED next to the words "KEYPAD ACTIVE" is lit.

2. If you press [RUN] during any time setting sequence, (a) the entry aborts and (b) the 6351 returns to normal operation (displays the time again).

3. Holding [NO] depressed causes the display to scroll through all possible entries in each time setting step.

vs.

Keypad Normally Inactive

CPU Board's DIP switch #6 is in the OFF position.

1. When the 6351's keypad is inactive, the LED next to the words "KEYPAD ACTIVE" is not lit.

2. To activate the keypad, depress the [PROG], [RUN], [YES], and [ENTER] keys in that order.

- However, the keypad will only remain active for one minute without any entries being made.

3. If you press [RUN] during any time setting sequence, (a) the entry aborts and (b) the 6351 returns to normal operation (displays the time again).

- However, the keypad will remain active for one minute. But if you want to deactivate the keypad immediately after your 6351 returns to normal operation, press [RUN] again.

4. Holding [NO] depressed causes the display to scroll through all possible entries in each time setting step.

Keypad Modes

Depressing any one of the following keys when the 6351's keypad (Figure 49) is active causes the unit to go into the mode represented by that key. The various modes (and keys used to select them) are:

[12/24] To enter hour format (12 or 24) for the LCD

[TIME] To set time and day of the week

[DATE] To set date

[DST] To program for automatic daylight saving time changes.

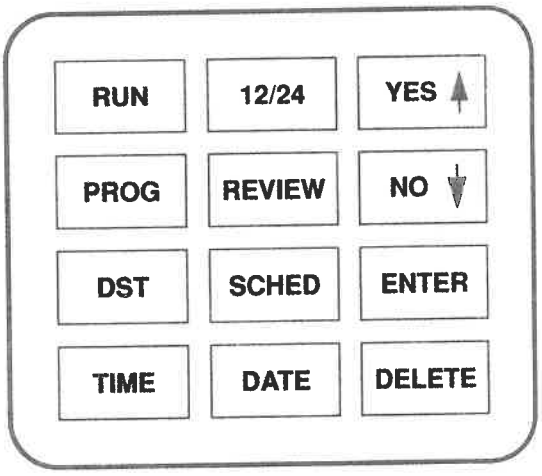


Figure 49
Keypad

BASIC ENTRIES

To Enter Hour Format (12 or 24) for LCD

Depress [12/24]

- The display immediately changes from 24 to 12-hour format (or vice versa).

Note: The 6351 both prompts for and shows timed command entries in the same format as it is currently displaying the time in.

To Set the Time and Day of the Week

1. Depress [TIME], see Figure 50 for display.
   - The display digits show HR:MINS SECS.
2. Prompts appear in order below. You must depress [YES] or [NO] in response to each prompt.
   a. Day of the Week
   b. Hour
   c. Minute
   d. Seconds

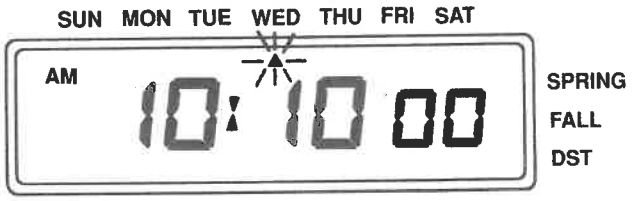


Figure 50
LCD After Depressing TIME Key

Note: Time starts running when [ENTER] is depressed.

To Set the Date

1. Depress [DATE], see Figure 51 for display.
2. Prompts appear in the order below. You must depress [YES] or [NO] in response to each prompt.
   a. Year
   b. Month
   c. Date
3. Depress [ENTER] when all information is blinking.

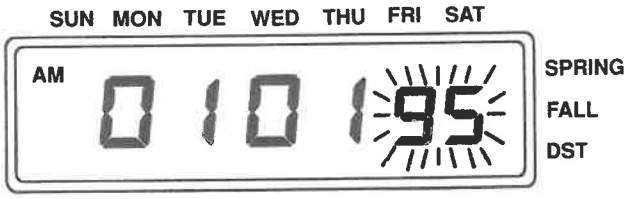


Figure 51
LCD After Depressing DATE Key

To Program for Automatic Daylight Saving Time (DST) Changes

1. Depress [DST], see Figure 52 for display.
   - The display digits show HR MO DATE
2. Prompts appear in the order below. You must depress [YES] or [NO] in response to each prompt.
   a. Spring or fall correction
   b. Correction month
   c. Correction date
   d. Correction hour

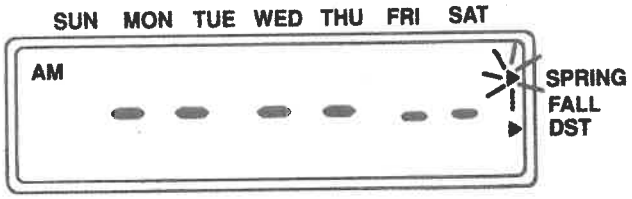


Figure 52
LCD After Depressing DST Key

NOTES

I. To delete (rather than enter) DST information, depress [DELETE] (instead of [YES] or [NO] to any of the above prompts). Then, when the display shows blinking dashes, depress [ENTER].

II. Since daylight saving/standard time dates change yearly, your 6351 cancels automatic DST information after using it once.

III. The spring DST change causes the 6351 to jump ahead one hour, and to ignore all functions programmed to occur during the missing hour. The fall DST change causes it to jump back one hour and to repeat all functions programmed to occur during the repeated hour.

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