

# INSTRUCTION SHEET

## VRC-1000 ACCESSORY

## FAIL SAFE UNIT

**GENTNER**  
RF PRODUCTS DIVISION

P.O. Box 32550 • San Jose, California 95152 • (408) 926-3400  
Telex II: 510-600-1445 GENTNER RF PRDT EasyLink: 62897417

2 5152  
PRDT

801 975-7200

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### FAIL-SAFE UNIT

The Fail-Safe Unit Option for the VRC-1000 provides a means of establishing absolute carrier control via the program audio feed to the transmitter site where the VRC-1000 is located. This absolute carrier control is required by the FCC when the VRC-1000 is used as the primary remote control system, and the VRC-1000 is functioning on the dial telephone system. Under these conditions the FCC requires that a means exist for absolute carrier control that is not dependent upon the dial telephone system. This Fail-Safe Unit senses the presence of program audio at the transmitter site. It can be set to be activated up to 99 seconds or 99 minutes after the loss of program audio. Thus, the presence of program audio becomes the absolute carrier control mechanism, when this Unit's output is interfaced to the plate off function of the transmitter.

### DESCRIPTION

The Fail-Safe Unit consists of a single printed circuit card mounted in a 1.75" rack-mounting chassis. All connections are made via the screw barrier strip on the rear of the Unit.

It's function is to sense the presence or lack of audio as presented to the input(s) on the rear of the Unit. - -

Setup of the Unit is accomplished by removal of the front-panel cover plate. This small plate provides access to the miniature switches that select the time for deactivation following the loss of program audio.

The front panel also contains three LED indicators. These are TIME OUT, SILENCE, and POWER. These provide indication of:

POWER - Illuminated when AC power is applied to the Unit.

SILENCE - Illuminated when the Unit recognizes silence.

TIME OUT - Illuminated when the Unit has recognized silence for the set time period and the relay output has been deactivated.

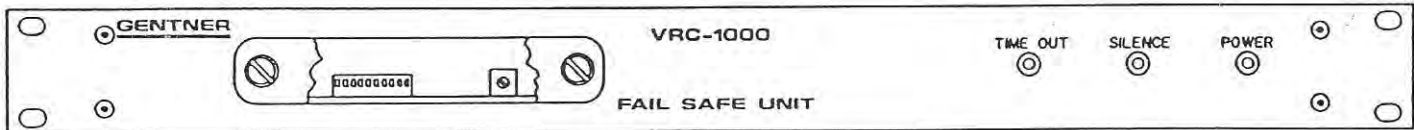
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The Unit recognizes both rising and falling edges of audio. In addition, it observes audio on a wideband basis, and in a narrowband manner at 470 Hz. This permits the Unit to ignore hum and other erroronous signals.

### OPERATION

Operation of the FAIL-SAFE Unit is very simple. The front panel controls need to be set only at the time of installation or if a change in timing is desired.

The adjustable controls are located behind the rectangular panel on the left hand side of the Front Panel a illustrated in the diagram below.



### FRONT PANEL

The controls consist of a bank of 10 switches and a trimmer potentiometer.

The multi-turn trimmer potentiometer is used to set the level of input program audio to which the FAIL-SAFE Unit responds. To set this control, apply program audio at the level which it will normally be used to the audio input connector on the rear of the unit. Set the control completely anti-clockwise. Turn this control clockwise to a point 1/10 of a turn beyond the point where the SILENCE LED extinguishes. The exact setting of this control is dependent on program content; certain formats may require that it be advanced a little less or further.

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The switches are used to set the delay time before the FAIL-SAFE Unit reacts to a loss of program audio. These function of these switches is as follows. Switch #1 is the left switch, and switch #10 the right switch when viewed from the front.

- Switch 1 Selects either minutes or seconds as the unit of time selected by the time-setting switches 3 to 10. UP = SECONDS, DOWN = MINUTES
- Switch 2 Not used
- Switch 3-6 TENS unit selection for time delay. These switches are in a BCD format, and can select any value between 1 and 9. The switch is ON when in the UP position. A selection of a decimal value of 0 to 9 is possible.  
Switch 3 = 80 units of time  
Switch 4 = 40 units  
Switch 5 = 20 units  
Switch 6 = 10 units
- Switch 7-10 SINGLE unit selection for time delay. Operation is the same as with switches 3-6.  
Switch 7 = 8 units of time  
Switch 8 = 4 units  
Switch 9 = 2 units  
Switch 10 = 1 unit

Thus, to select a time delay of 29 minutes, set the switches as follows:

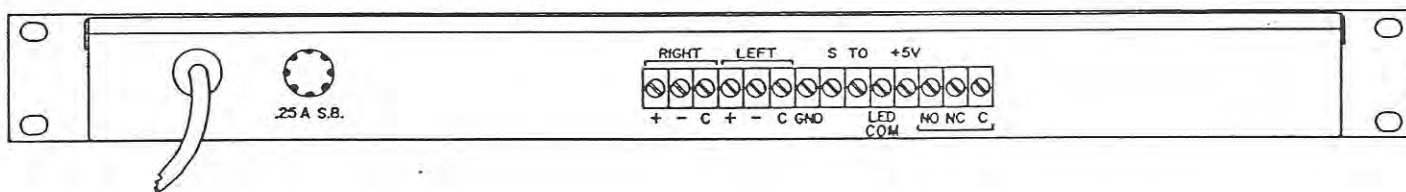
Switch #	POSITION
1	DOWN
2	DOWN
3	DOWN
4	DOWN
5	UP
6	DOWN
7	UP
8	DOWN
9	DOWN
10	UP

This concludes the set-up procedure of the FAIL-SAFE Unit. Operation is completely automatic.

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### INSTALLATION

All interfacing to and from the FAIL-SAFE unit is made through the rear-panel barrier strip, as illustrated below.



### REAR PANEL

Two audio input connections are provided for stereo stations, labelled "Right" and "Left". Mono audio can be applied to either channel.

The "S" terminal provides an open-collector closure (100 mA maximum) to ground when program audio is lost (silence).

The "TO" terminal provides an open-collector closure (100 mA maximum) to ground when program audio has been absent for greater than the time period set with the front panel switches; i.e. the unit has "Timed Out".

The "LED COM" terminal provides voltage for LED indicators that can be controlled by the "S" and "TO" contacts. No voltage dropping relay is required as it is already located within the FAIL-SAFE Unit.

The "+5V" terminal provides +5 VDC output to power relays if desired. The relay path would be completed by "S" or "TO".

The "NO,NC,C" terminals provide access to the relay controlled by the FAIL-SAFE Unit.

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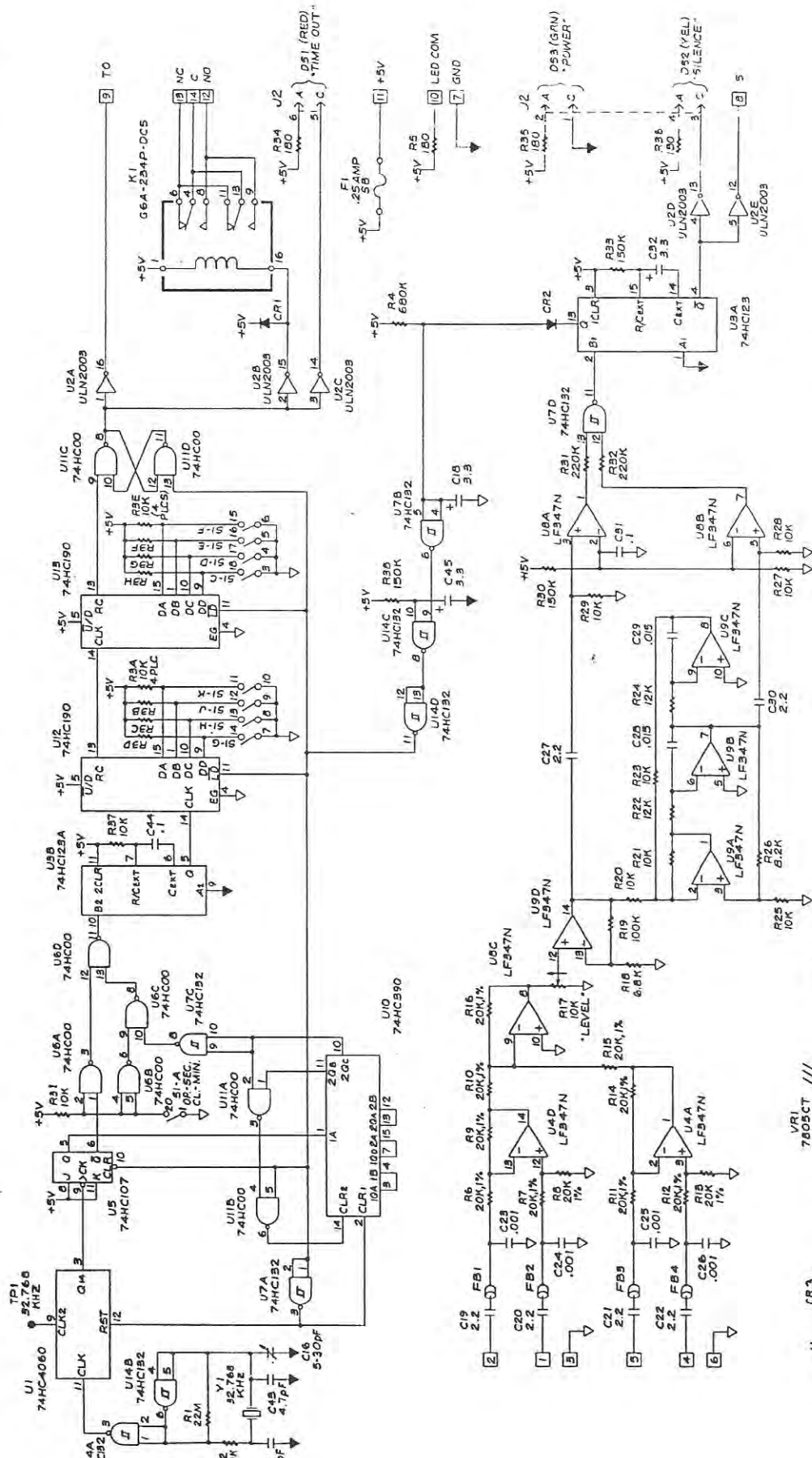
### VOLTAGE SELECTION

The FAIL-SAFE unit can operate from either 120 or 240 Volts AC. The unit is delivered configured for 120 VAC.

The operating voltage selection is accomplished in exactly the same way as in the VRC-1000. To change the unit to 240 VAC operation, remove the cover and locate the Molex connector attached to the primary of the transformer. Note that a WHITE connector is plugged into it. Attached to the white connector is a similar red connector. Unplug this white connector, and replace it with the RED connector.

This procedure is illustrated in the VRC-1000 operational manual, in section 3.3.

To summarize:           WHITE connector - 120 VAC  
                              RED connector - 240 VAC

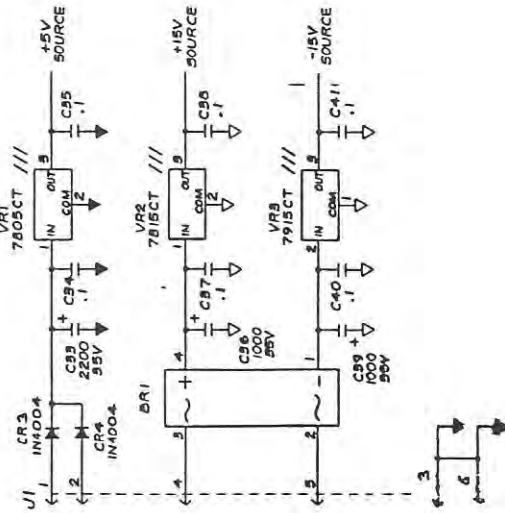


INTEGRATED CIRCUITS

TYPE	REF.	GND	+5V	BYP	-5V	BYP	+15V	BYP
74HC4060	U1	8	16	C1	---	---	---	---
ULN2003	U2	8	16	C2	---	---	---	---
74HC190	U3	8	16	C3	---	---	---	---
74HC192	U4	---	---	---	---	---	---	---
74HC107	U5	7	14	C5	---	---	---	---
74HC00	U6	7	14	C6	---	---	---	---
74HC192	U7	7	14	C7	---	---	---	---
74HC190	U8	---	---	---	---	---	---	---
74HC190	U9	---	---	---	---	---	---	---
74HC190	U10	8	16	C12	---	---	---	---
74HC00	U11	7	14	C19	---	---	---	---
74HC190	U12	7	14	C18	---	---	---	---
74HC190	U13	8	16	C15	---	---	---	---
74HC192	U14	7	14	C48	---	---	---	---

NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 A. FIXED RESISTORS ARE 1/4 WATT.  
 B. RESISTANCE VALUES ARE IN OHMS ±5%.  
 C. CAPACITANCE VALUES ARE IN MICROFARADS.  
 D. DIODES ARE IN 4-14S.

2. INTERCONNECTION DIAGRAM: CAL-003-201



LAST NO. USED

COMPONENT	REF.	OBS.
I.C.	U14	---
RESISTORS	R50	---
CAPACITORS	C45	---
DIODES	CR4	---

