SIEMENS
Westinghouse

RMS CURRENT MEASUREMENT

With

WESTRIP™
SOLID STATE RETRO KITS

Circuit Breaker
Solid State Controls
Utilizing

WESTRIP™
Logic

The **WESTRIP** Solid State Tripping Systems Have Been Designed, Tested and Produced To all Applicable NEMA and UL Standards.

PATENT NO. 4,866,557

"ANSI C37.59"

TELEPHONE
TOLL FREE: (877) 937-8747
FAX: (905) 549-1189

WESTRIP RMS-2000 Manual
Rev.02: May 17, 2001

Technical Aspects Bulletin

WESTRIP RETRO-KITS

Upgrade your circuit breaker with reliable, modern technology at a fraction of the cost. **WESTRIP RETRO-KITS** are comprised of the highest quality engineered components to easily retrofit circuit breakers regardless of the original quality or manufacturer.

Siemens Westinghouse offers installation and modernization of your low voltage circuit breakers in facilities across North America

WESTRIP RETRO-KITS OFFER THESE EXCLUSIVE FEATURES

1.	Circuit design provides universality of time-current settings to allow one model for the full range of current settings required by normal applications.
2.	Rotary switch adjustments provide precise, definite, and repeatable settings.
3.	Each printed circuit board is treated to prevent contamination and signal leakage.
4.	Metal enclosure, as standard, to shield against noise, magnetic interference and contamination.
5.	Target diagnostic circuitry is designed to provide maximum protection capability to reduce system downtime by analyzing any over current fault and visually identifying it's cause as an overload, short circuit or ground fault. Additionally, no batteries are required to maintain trip indication.
6.	A Long Time pickup timing indicator, as standard, to aid in identifying an over current condition in process.
7.	Circuit design allows for both local and remote fault indications. An optional feature can be added so that the unit can be interfaced with an existing communication's system.
8.	An 'I^2T' Short Time Delay switch setting to provide maximum coordination with the inrush currents of motors and transformers.
9.	Circuitry built for protection against RF radiation, transient voltage, and harmonic problems.
10.	Current sensors are epoxy encapsulated as standard.
11.	Current sensors are designed to mount on the rear of the breaker for maximum ease of retrofitting circuit breakers.
12.	Actuators are designed and manufactured for mounting on a wide range of circuit breakers at a minimum installation expense.
13.	Actuators are manufactured with metals that help eliminate corrosion to prevent inoperable mechanisms.
14.	Portable test set to facilitate in-house secondary testing of in service WESTRIP units at full current rating 0-60 amps.

Our full range of **WESTRIP RETRO-KITS** will allow our customers to retro-fit any circuit breaker with the features required for all the various applications demanded with both cost and feature benefits which are unprecedented in the marketplace.

RMS MEASUREMENT OF SINUSOIDAL AND NON-SINUSOIDAL CURRENT

The **WESTRIP RMS-2000 LOGIC CONTROL** monitors current overloads accurately for electrical distribution systems including AC & DC variable speed drives, induction heating, and other loads that cause Non-Sinusoidal wave distortion.

WESTRIP RETRO-KITS

CURRENT SENSORS

Current sensors are typically mounted on the rear bus-bar stabs of the circuit breaker. They produce a current output proportional to the load current of the breaker. Since the universal **WESTRIP LOGIC CONTROL** requires only nominal signal of 5A per breaker frame, the following current sensor ratings are available. Other ratings are available as special order at no additional charge. Using the 'SENSOR TAP' in conjunction with the 'AMP TAP' switch on the logic control, the following 'AMPERE RANGE' can be achieved for each 'FRAME'. Designs also exist for internal mounting of current sensors for fixed breakers.

FRAME SIZE AMPERES	SENSOR TAP	AMPERE RANGE
225	225/100:5A	40-225
600	600/225:5A	45-600
1600	1600/800:5A	160-1600
3200	3000/1600:5A	320-3000
4000	4000/1600:5A	320-4000

The **WESTRIP CONTROLS** are universally adjustable and are compatible with any 5 amp secondary current sensor. If load conditions change, it is only necessary to readjust the 'Amp Tap' switch located on the Logic Control and not to replace or rewire the current sensors.

ACTUATORS

Actuators are manufactured to mount on standard breaker frames with minimal time and expense. With a minimum of 6 lbs. latching and tripping, they will trip the breaker when required and at the same time, eliminate nuisance tripping.

WESTRIP RMS-2000 OEM REPLACEMENT TRIP UNIT

The RMS-2000 OEM replacement trip unit is supplied with the same full load pick up characteristics to enable the replacement of obsolete OEM trip units. By utilizing the existing current sensors and/or magnetic latch, the circuit breaker can be updated with minimal cost and downtime.

TEST SET

A full function test set has been developed for use with the **WESTRIP LOGIC CONTROL**. It will check the time current characteristics of the logic programmer at an infinite number of points along its curves, test the programmer diagnostic circuitry, current sensor continuity and flux shifter operation. The test set is a rugged, lightweight, portable device designed specifically with the service man in mind.
The Test Set operates, at full load, at more than 60 amps when attached to the RMS-2000. The test set is designed to handle current amplitudes according to the Long Time trip curves.

COMMUNICATIONS INTERFACE OPTION

The optional 'Communications Interface' provides the user with the ability to interface the WESTRIP LOGIC CONTROL with an existing communication system. The logic provides sets of normally open dry contact outputs, which are available through a second terminal block located on the left side of the Logic Control. The respective output will latch closed on a fault condition and will remain closed until it is reset. Reset will occur when the 'INDICATOR RESET' switch is pressed or when the 'Remote Reset' terminals on the 'CI' terminal block are shunted.
Outputs are provided for each target indicator, which may include 'Short Circuit', 'Overload', and 'Ground Fault'. A contact for 'Trip' can also be provided. Actual outputs will vary depending upon customer needs.
The relays are setup to close each time the target indicators flip and the logic trips. On startup conditions, an 'Instantaneous' trip may not be indicated by relay closure due to the high speed at which it occurs. When the elapsed time exceeds 100 milliseconds, relay closure is guaranteed. To provide for the relays to be reset, current must be flowing to the logic at a level of at least 20% of the Current Transformer rating.

RMS-2000 SOLID STATE PROGRAMMER

The **WESTRIP** solid state programmer is a static trip device designed to provide more precise and definite tripping characteristics than obsolete Electro-mechanical or thermal type trip units.

The **WESTRIP** programmer is a single unit configuration, which is illustrated in Drawing 2 on page 8. The Logic Control has standard features such as 'LONG TIME', 'SHORT TIME', and 'INSTANTANEOUS' tripping functions, 'AMP TAP', 'I^2T', Long Time pick up light, Trip indicators, and an Indicator reset button. 'GROUND FAULT' tripping function is available as an option. The 'Defeat Selector' switch allows customers the ability to configure the unit without the 'SHORT TIME' or 'INSTANTANEOUS' function. The unit has a built-in discriminator circuit that is operational for approximately 128 milliseconds upon startup. If a fault condition exists that exceeds a 12X rating, the logic will send an 'INSTANTANEOUS' trip signal to the actuator. This is an added safety feature that protects against bolted faults upon startup.

Drawings Legend

Specific pickup points for each function are shown in drawing 2, while the basic functions are described in the following table. Examples are given in each description.

LEGEND TO DRAWING 2

1. AMP TAP
2. LONG TIME PICK-UP
3. LONG TIME DELAY
4. SHORT TIME PICK-UP
5. SHORT TIME DELAY
6. INSTANTANEOUS PICK-UP
7. DEFEAT SELECTOR
8. GROUND FAULT PICK-UP
9. GROUND FAULT DELAY
10. FAULT TRIP INDICATORS
11. INDICATION RESET BUTTON
12. LONG TIME PICK-UP LED
13. SENSOR TERMINAL BLOCK
14. COMMUNICATION INTERFACE TERMINAL BLOCK (OPTION)

#1 AMP TAP SWITCH

This standard six-step adjustment varies the level of current the logic monitors from the Current Sensor's Tap Rating. The range of selection is from 50% to 100% in 10% increments. Changing this setting has the same effect as changing the value of the current sensor. This setting does not affect the 'GROUND FAULT' pick up settings.
Example:
1600-amp current sensor, with the 'AMP TAP' switch set at .5, logic control now monitors 800-amp maximum continuous current. The 'LONG TIME', 'SHORT TIME', AND 'INSTANTANEOUS' pick-ups are all coordinated to the 800-amp level. The 'GROUND FAULT' pick up will remain relative to the Current Sensor Tap rating.

#2 LONG TIME PICKUP

The 'LONG TIME' Pick-up switch provides an additional current adjustment capability for the breaker with ten steps from 40% to 100% also in 5% & 10% increments. This function limits the amount of continuous current that the breaker will handle without tripping. This level should never exceed the maximum rating of the conductors within the breaker or switchgear. Changing this setting does not affect any other function.
Example:
1600-amp current sensor, with 'AMP TAP' switch set at .6 = 960-amps. With 'LONG TIME' Pick-up set at .4, the maximum continuous current rating of the circuit breaker is now at 384-amp. The 'SHORT TIME' and 'INSTANTANEOUS' are coordinated to 960-amp.

#3 LONG TIME DELAY

This ten-step time adjustment varies the time that the breaker will operate under sustained overload without tripping. The time varies depending upon the level of the overcurrent condition. The settings on the faceplate are relative to a current level of 600% of the 'LONG TIME' pick up switch setting.
Example:
1600-amp current sensor, Logic Control set as above, with the 'LONG TIME' delay set at '5'. With a current level of 2304-amp, the breaker would trip in about 5 seconds.

#4 SHORT TIME PICK-UP

The 'SHORT TIME' Pick-up switch controls the level of high current the breaker will carry for short periods of time without tripping. This function has a ten-step adjustment, which varies between 1.5 and 10 times. It is coordinated to the Current Sensor rating and the 'AMP TAP' switch setting.
Example:
1600-amp current sensor, Logic Control set as above, with the 'SHORT TIME' Pick-up switch set at '6' provides a 5,760-amp trip setting.

#5 SHORT TIME DELAY AND I^2T

This ten-step delay adjustment provides a further coordination between circuit breakers. It allows the breaker a time interval before responding to the selected 'SHORT TIME' current levels. 9 steps allow the time duration to be adjusted between '. 1' and '. 5' seconds in .05 increments. The final step, 'I^2T', provides the ability of introducing an additional energy ramp into the short time function delay. This provides maximum coordination benefits especially for motor start applications. Thus the short time function can be set at lower levels without tripping on motor startup.

#6 INSTANTANEOUS PICK-UP

This function determines the level at which the breaker will trip without intentional time delay. Depending upon the setting, the instantaneous interruption will normally occur only as a result of a severe short circuit fault condition.
Example:
1600-amp current sensor, Logic Control set as above, with the 'INSTANTANEOUS' Pick-up switch set at '10' provides a 9,600-amp trip setting.

#7 DEFEAT SELECTOR

Provides the installer and the end user the ability to configure the unit according to the specific needs of the power system that it has been installed on. Also allows the unit to be adapted to the changing requirements of the system, thus eliminating the need to special order a unit without either the 'Instantaneous' or 'Short Time' function.
Example:
1600-amp current sensor, Logic Control set as above, with the 'DEFEAT SELECTOR' switch set at 'SHORT TIME', the logic will not trip due to a 'Short Circuit' condition until the current level reaches 9,600-amp.

#8 GROUND FAULT PICK-UP

This ten-step adjustable function determines the level of ground fault current at which circuit interruption will occur. This setting is a multiple of the sensor rating and is not affected by the 'AMP TAP' setting.
Example:
1600-amp current sensor, Logic Control set as above, with the 'GROUND FAULT' Pick-up switch set at '. 5' provides an 800-amp trip setting.

#9 GROUND FAULT DELAY

This ten-step adjustment allows a predetermined time delay to be introduced into the ground fault circuit. It provides the breaker a time interval before responding to the selected 'GROUND FAULT' current levels. The time duration can be adjusted between '.1' and '.5' seconds in .05 increments with the final setting at '.6'.

#10 FAULT TRIP INDICATORS

These fault indicators identify the cause of an over-current trip and help to reduce system down time. The electronic flip-flag indicators analyze the fault and provide a memory of the trip. They do not require batteries to maintain the indication. As an option, fault indicators can be mounted remotely.

#11 INDICATOR RESET SWITCH

This switch resets the all trip indication after a fault condition. The indication provided by the target indicators and communication outputs, if ordered, will be cleared.

#12 LONG TIME PICK-UP

This feature provides visual indication of an overload condition. The LED will light when the 'LONG TIME' pick up level is exceeded and timing begins. It will remain lit throughout the duration of the time band unless the current level falls below the set point.

#13 POWER INDICATOR

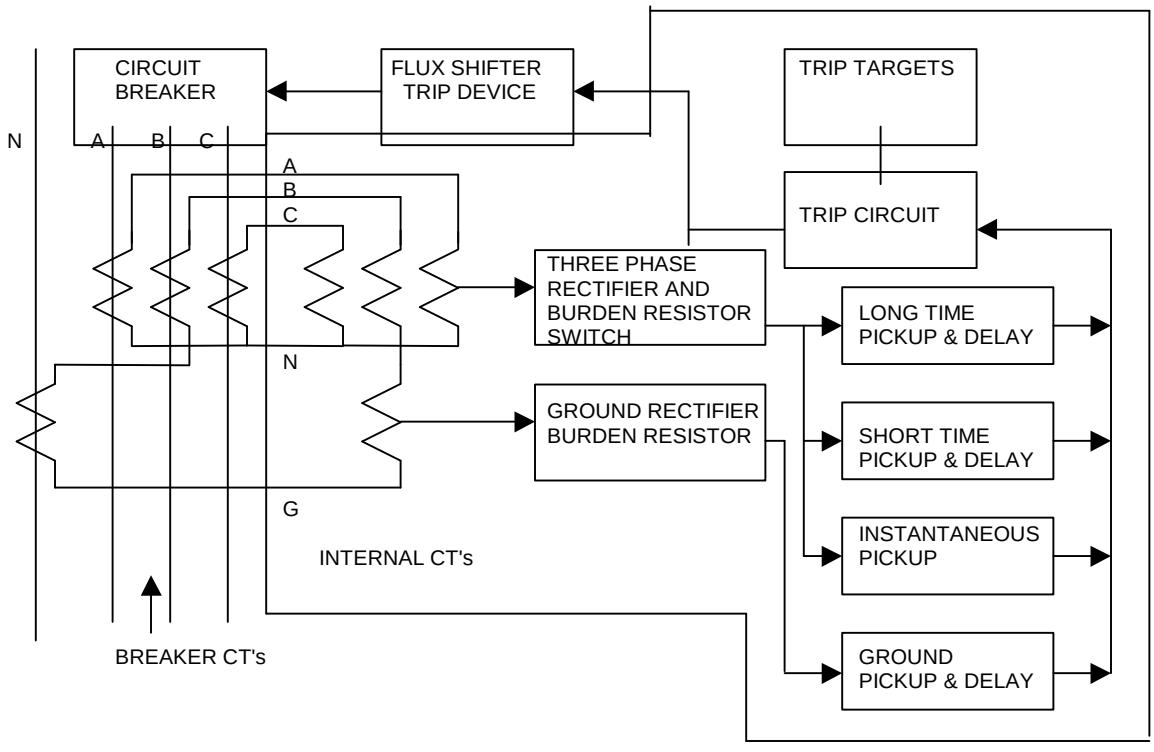
Lights when current level flowing has reached a sufficient level to cause the unit to function.

#14 SENSOR TERMINAL BLOCK

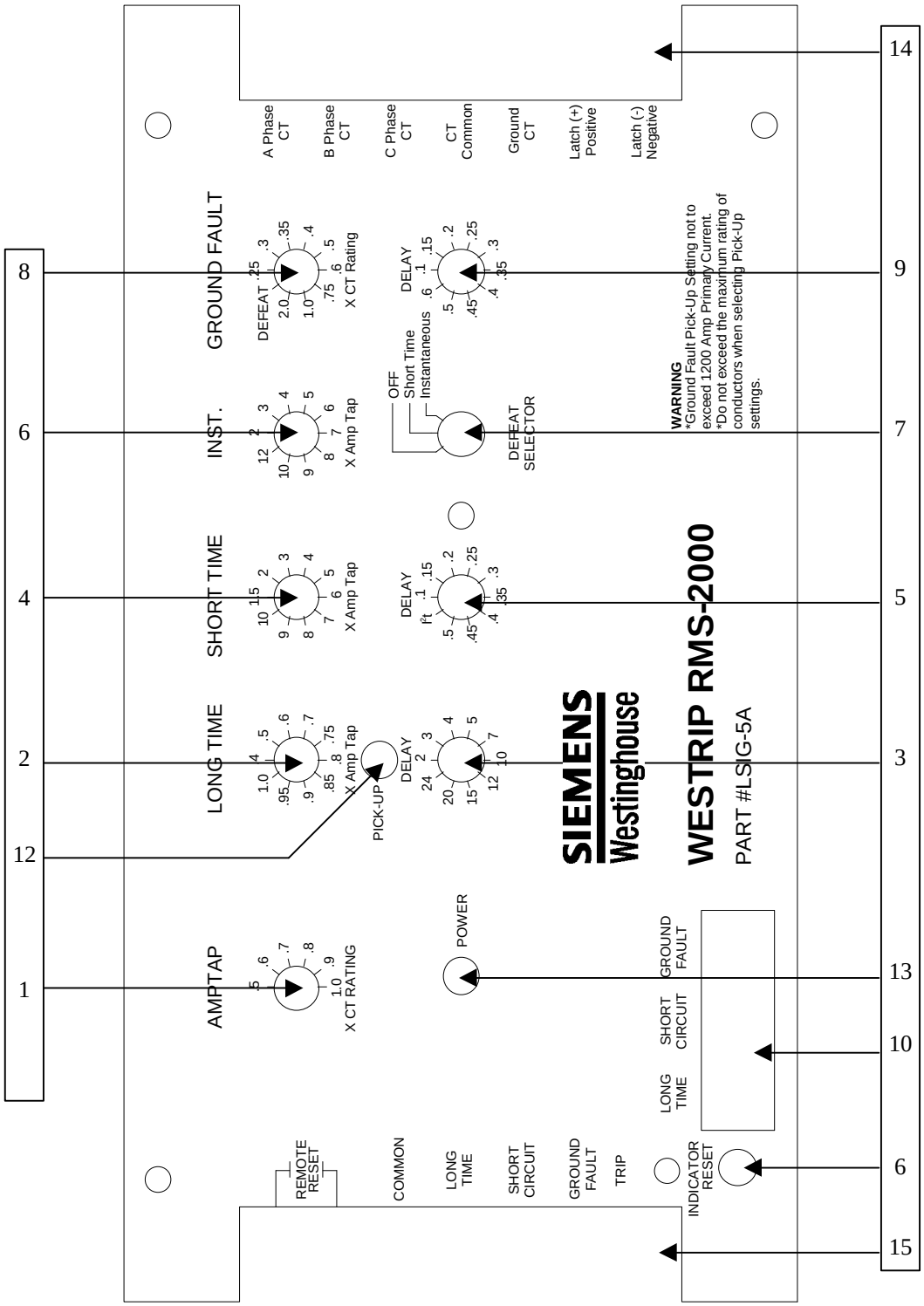
Seven-position terminal block that allows the 'Logic Control' to be interfaced with the Sensors and Actuator. The connections will be made per the indication of the Faceplate.

#15 COMMUNICATION INTERFACE TERMINAL BLOCK (OPTION)

Optional seven-position terminal block that allows the 'Logic Control' to be interfaced with an existing communication system. The connections will be made per the indication of the Faceplate. The 'Remote Reset' requires only a dry contact closure to reset the indication within the box.



FUNCTION BLOCK DIAGRAM
DRAWING 1



FRONT PANEL LAYOUT
DRAWING 2

TEST PROCEDURE FOR PROGRAMMABLE LOGIC CONTROLLER USING A SECONDARY TEST SET

1. Using the test set wiring harness, connect to the test set and to the logic box to be tested.
2. Verify all control settings are on the minimum settings and turn on the “Test Set”.
3. Reset the “Trip Timer”.
4. If an external ammeter is to be used, connect it to the “Test Set” at this time.
5. After testing a selected pick-up current or delay function, it is advised that the “Variac” control be returned to zero before proceeding to the next test.
6. When testing pick-up currents, start by selecting the lower range on the output. With the “Variac” at zero turn clockwise until the unit trips or the pick-up light turns on. If the logic controller does not trip at this setting, return the “Variac” to zero and select a higher range on the output and proceed with the test.
7. Testing of each function is described in more detail on the following pages.
8. The Logic can be tested with the Amptector secondary test set. **WESTRIP** can supply an adapter plug that allows for connection between the logic and the test set.

The “Sample Test Chart” below gives a basic layout for recording the results of the test performed on a Logic Control. The form can be used when testing on secondary or primary.

SAMPLE TEST CHART

DATE: ____/____/____

LOGIC SERIALNUMBER: _____

LONG TIME FUNCTION:

SWITCH SETTING _____ AMP TAP _____ PICKUP CURRENT _____

DELAY SETTING _____ TEST CURRENT_____ ELAPSED TIME A_____ B_____ C_____

SHORT TIME FUNCTION:

SWITCH SETTING _____ AMP TAP _____ PICKUP CURRENT _____

DELAY SETTING _____ TEST CURRENT_____ ELAPSED TIME A_____ B_____ C_____

INSTANTANEOUS FUNCTION:

SWITCH SETTING _____ AMP TAP _____ PICKUP CURRENT _____

TEST CURRENT_____ ELAPSED TIME A_____ B_____ C_____

GROUND FAULT FUNCTION:

SWITCH SETTING _____ PICKUP CURRENT _____

DELAY SETTING _____ TEST CURRENT_____ ELAPSED TIME A_____ B_____ C_____

LONG TIME FUNCTION TESTING

PICK-UP TEST

1. Select the Phase to be tested. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Set the 'LONG TIME' Delay switch to '2' and the 'LONG TIME' Pick up switch to the test point.
3. Start the "Test Set" and slowly increase the "Variac" from "0" until the 'PICK-UP' LED on the logic box lights.
4. Record the reading of the "Ammeter" just as the pick-up LED lights. Compare the reading to that of Chart 2A.
5. Return "Variac" control to "0". Repeat for other phases or pick-up settings if desired.

LONG TIME DELAY

1. Select the Phase to be tested. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Set the 'LONG TIME' Delay switch to the desired setting; '2', '3', '4', '5', '7', '10', '12', '15', '20', or '24'. These settings are referenced to a current level equal to 600% of the 'LONG TIME' Pick-Up. Actual delays can vary in accordance with the 'Time vs. Current Characteristic' curves. If a lower current level is used, refer to the table below for the corresponding timing range.
3. After the logic is adjusted, set the test current to the desired level, i.e. 300% of the long time pick-up switch setting. Stop the test and make certain the timer is reset.
4. Restart the 'Test Set' and let run until the logic trips and the breaker opens. The timer should indicate the elapsed time. Compare this time to that of the Chart 1A below or the trip curves. Repeat for other phases or switch settings if desired.
5. Return the "Variac" to "0".

Chart 1A – Long Time Delay

		Test Current Level					
		200%		300%		600%	
		Low Side	High Side	Low Side	High Side	Low Side	High Side
Delay Setting	2	14.4	21.6	6.4	9.6	1.6	2.5
	3	21.6	32.4	9.6	14.4	2.4	3.8
	4	28.8	43.2	12.8	19.2	3.2	5.0
	5	36	54	16	24	4	6.3
	7	50.4	75.6	22.4	33.6	5.6	8.8
	10	72	108	32	48	8	12.5
	12	86.4	129.6	38.4	57.6	9.6	15
	15	108	162	48	72	12	18.8
	20	144	216	64	96	16	25
	24	172.8	259.2	76.8	115.2	19.2	30

*Time in Seconds

Chart 2A – Long Time Pick-up Currents

		LONG TIME PICK UP						
		.4	.5	.6	.7	.8	.9	1.0
Amp Tap	.5	1.00	1.25	1.5	1.75	2.00	2.25	2.50
	.6	1.20	1.50	1.80	2.10	2.40	2.70	3.00
	.7	1.40	1.75	2.10	2.45	2.80	3.15	3.50
	.8	1.60	2.00	2.40	2.80	3.20	3.60	4.00
	.9	1.80	2.25	2.70	3.15	3.60	4.05	4.50
	1.0	2.00	2.50	3.00	3.50	4.00	4.50	5.00

SHORT TIME FUCTION TESTING

PICK-UP TEST

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Set 'SHORT TIME' Delay switch to '.15' and adjust the 'SHORT TIME' Pick up switch to the test point.
3. Start the "Test Set" and slowly increase the "Variac" from "0" until the logic trips.
4. Record the reading of the "Ammeter" at the moment the trip occurs. Compare the reading to the value found in Chart 2B. Repeat for other phases or pick-up settings if desired.
5. Return the "Variac" to "0".

SHORT TIME DELAY

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Set the 'SHORT TIME' Delay switch to the desired setting; '.1', '.15', '.2', '.25', '.3', '.35', '.4', '.45', '.5', or 'I^2T'.
3. Start the "Test Set" and set the test current to a level that is 150% of the 'SHORT TIME' Pick-up current. In order to perform this step, the 'SHORT TIME' and 'INSTANTANEOUS' pick-up switch on the logic box must be set to its maximum setting to prevent tripping. Once the "Variac" control is set, place the 'SHORT TIME' Pick-up switch to the test setting. Stop the test and make certain the timer is reset.
4. Restart the 'Test Set' and let run until the logic trips and the breaker opens. The timer should indicate the elapsed time. Compare this time to that of the Chart 1B below or the trip curves. Repeat for other phases or switch settings if desired.
5. Return the "Variac" to "0".

Chart 1B – Short Time Delay

		Test Current Level	
		150%	
		Low Side	High Side
Delay Setting	.1	80	125
	.15	120	188
	.2	160	250
	.25	200	313
	.3	240	375
	.35	280	438
	.4	320	500
	.45	360	563
	.5	400	625
	**I^2T	.58 Sec.	.90 Sec.

*Time in milliseconds

**I^2T Test Settings: 'AMP TAP' = '1.0', 'SHORT TIME' = '2', Test current = 15A.

Chart 2B – Short Time Pick-up Currents

		SHORT TIME PICK UP									
		1.5	2	3	4	5	6	7	8	9	10
Amp Tap	.5	3.75	5.00	7.50	10.0	12.5	15.0	17.5	20.0	22.5	25.0
	.6	4.50	6.00	9.00	12.0	15.0	18.0	21.0	24.0	27.0	30.0
	.7	5.25	7.00	10.5	14.0	17.5	21.0	24.5	28.0	31.5	35.0
	.8	6.00	8.00	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0
	.9	6.75	9.00	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0
	1.0	7.50	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0

INSTANTANEOUS FUNCTION TESTING

PICK-UP TEST

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Set 'INSTANTANEOUS' Pick up switch to the test point.
3. Start the "Test Set" and slowly increase the "Variac" from "0" until the logic trips.
4. Record the reading of the "Ammeter" at the moment the trip occurs. Compare the reading to the value found in Chart 2C. Repeat for other phases or pick-up settings if desired.
5. Return the "Variac" to "0".

INSTANTANEOUS DELAY

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test.
2. Start the "Test Set" and set the test current to a level that is 150% of the 'INSTANTANEOUS' Pick-up current. In order to perform this step, the 'SHORT TIME' and 'INSTANTANEOUS' pick-up switch on the logic box must be set to its maximum setting to prevent tripping. Once the "Variac" control is set, place 'INSTANTANEOUS' Pick-up switch to the test setting. Stop the test and make certain the timer is reset.
3. Restart the 'Test Set' and let run until the logic trips and the breaker opens. The timer should indicate the elapsed time. Compare this time to that of the Chart 1C below or the trip curves. Repeat for other phases or switch settings if desired.
4. Return the "Variac" to "0".

Chart 1C – Instantaneous Delay

Set Secondary Current	No More Than
To 150% of Chart 2C	.06 Sec

Chart 2C – Instantaneous Pick-up Currents

		INSTANTANEOUS PICK UP									
		2	3	4	5	6	7	8	9	10	12
Amp Tap	.5	5.00	7.50	10.0	12.5	15.0	17.5	20.0	22.5	25.0	30.0
	.6	6.00	9.00	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0
	.7	7.00	10.5	14.0	17.5	21.0	24.5	28.0	31.5	35.0	42.0
	.8	8.00	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	48.0
	.9	9.00	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0	54.0
	1.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	60.0

GROUND FAULT FUNCTION TESTING

PICK-UP

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test. Verify that "Ground Fault" testing is enabled.
2. Set 'GROUND FAULT' Delay switch to '.15' and adjust the 'GROUND FAULT' Pick up switch to the test point.
3. Start the "Test Set" and slowly increase the "Variac" from "0" until the logic trips.
4. Record the reading of the "Ammeter" at the moment the trip occurs. Compare the reading to the value found in Chart 2D. Repeat for other phases or pick-up settings if desired.
5. Return the "Variac" to "0".

GROUND DELAY

1. Select the Phase to be tested and set the 'LONG TIME' Delay switch to '24'. Make certain all other functions are adjusted so as not to interfere with the selected test. Verify that "Ground Fault" testing is enabled.
2. Set the 'GROUND FAULT' Delay switch to the desired setting; '.1', '.15', '.2', '.25', '.3', '.35', '.4', '.45', '.5', or '.6'.
3. Start the "Test Set" and set the test current to a level that is 300% of the 'GROUND FAULT' Pick-up current. In order to perform this step, the 'GROUND FAULT' pick-up switch on the logic box must be set to its maximum setting to prevent tripping. Once the "Variac" control is set, place the 'GROUND FAULT' Pick-up switch to the test setting. Stop the test and make certain the timer is reset.
4. Restart the 'Test Set' and let run until the logic trips and the breaker opens. The timer should indicate the elapsed time. Compare this time to that of Chart 1D below or the trip curves. Repeat for other phases or switch settings if desired.
5. Return the "Variac" to "0".

Chart 1D – Ground Fault Delay

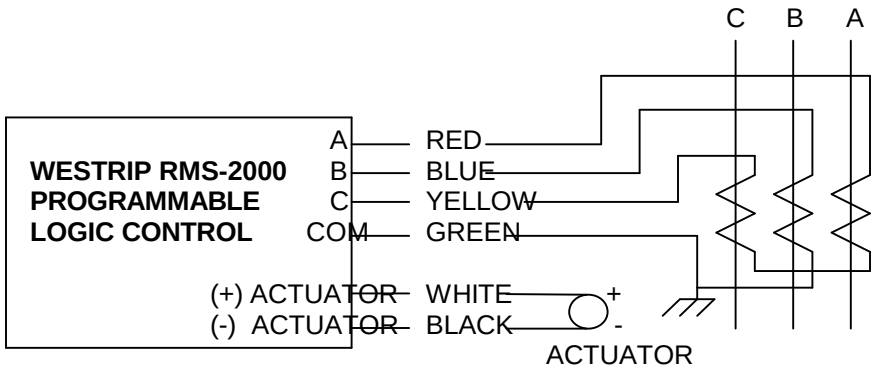
		Test Current Level	
		300%	
		Low Side	High Side
Delay Setting	.1	80	125
	.15	120	188
	.2	160	250
	.25	200	313
	.3	240	375
	.35	280	438
	.4	320	500
	.45	360	563
	.5	400	625
	.6	480	750

*Time in milliseconds

Chart 2D – Ground Fault Pick-up Currents

GROUND FAULT PICK UP									
.25	.3	.35	.4	.5	.6	.75	1.0	2.0	Defeat
1.25	1.50	1.75	2.00	2.50	3.00	3.75	5.00	10.0	No Trip

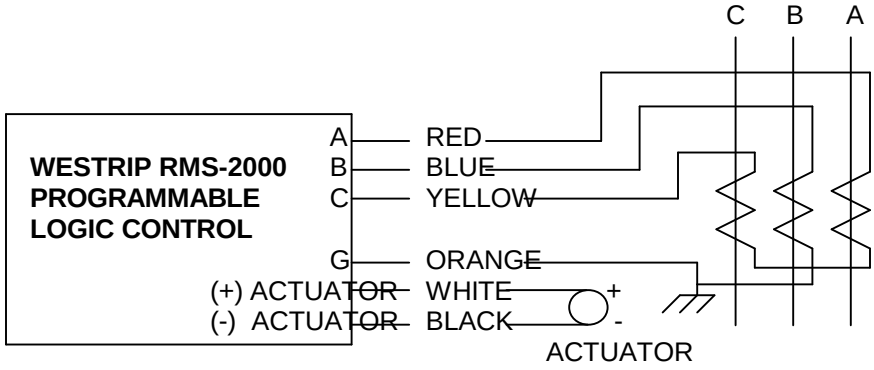
NOTE – 'GROUND FAULT' Pick ups not affected by 'AMP TAP' setting.



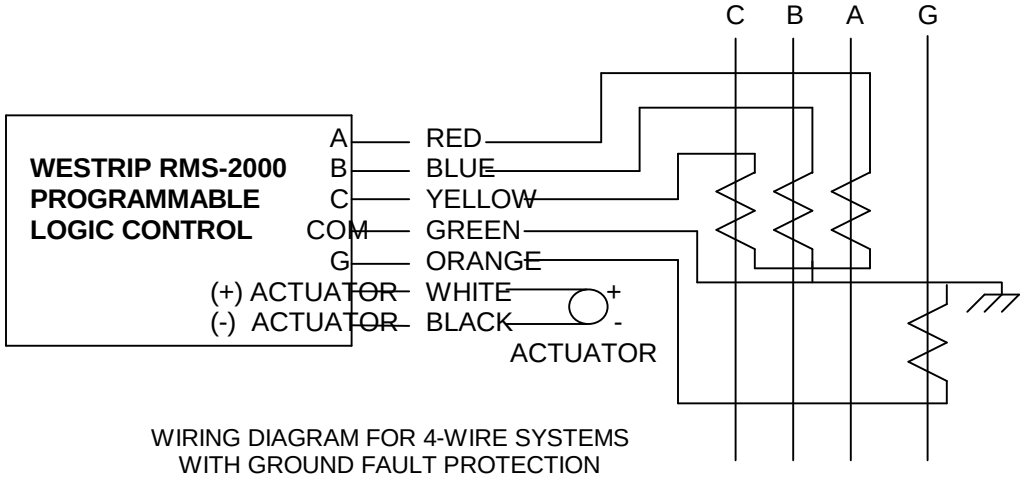
WIRING DIAGRAM FOR SYSTEMS WITHOUT
GROUND FAULT PROTECTION
DRAWING 3

TESTING GROUND FAULT SYSTEMS

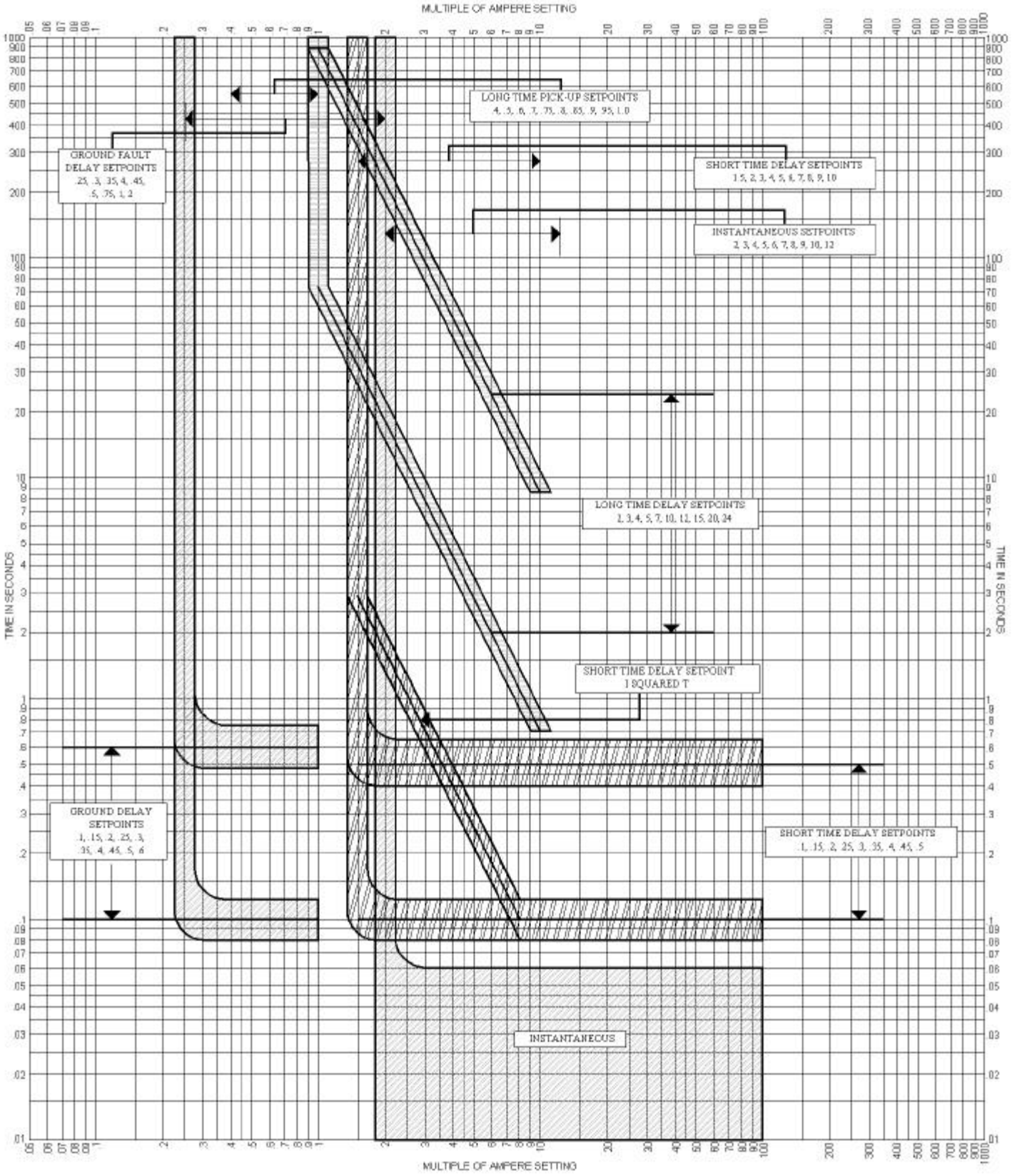
Connect the green wire from the wiring harness (COMMON) to the CT's while testing all trip functions, except the ground fault. To test the ground fault function, disconnect the green wire and connect the orange wire and perform the test.



WIRING DIAGRAM FOR 3-WIRE SYSTEMS
WITH GROUND FAULT PROTECTION
DRAWING 4



WIRING DIAGRAM FOR 4-WIRE SYSTEMS
WITH GROUND FAULT PROTECTION
DRAWING 5



WESTRIP RMS-2000 PROGRAMMABLE LOGIC CONTROL Rev.01 TIME-CURRENT CHARACTERISTIC CURVES

FOR

DATED MAY 17, 2001

STANDARD DEVIATION FOR AMPERE SETTING IS +/- 10%

WESTRIP™ RMS-2000

OEM REPLACEMENT TRIP UNIT

THE RMS-2000 IS SPECIFICALLY DESIGNED TO ALLOW THE USER THE FLEXIBLITY OF ***UTILIZING THE EXISTING CURRENT SENSORS AND ACTUATORS*** *WHEN AVAILABLE. THE OEM REPLACEMENT TRIP UNIT IS THE STANDARD RMS-2000, BUT IS BUILT TO WORK WITH THE SPECIFIC RATIO OF THE CURRENT SENSORS THAT HAVE ALREADY BEEN INSTALLED ON THE BREAKER.*

TRUE RMS CURRENT SENSING **PATENTED TECHNOLOGY**

MODELS AVAILABLE

RMS-2000-1A	1 AMP PICKUP
RMS-2000-2A	2 AMP PICKUP
RMS-2000-5A	5 AMP PICKUP

THE WESTRIP RMS-2000-'X'A CAN BE CALIBRATED TO MEET OEM CURRENT TRANSFORMER OUTPUTS, NOT LESS THAN 1 AMP.

THE WESTRIP RMS-2000-'X'A CAN REPLACE ALL THE TRIP UNITS LISTED BELOW AND MORE. If you do not see your specific unit listed, please contact sales at the Toll-Free number on the cover.

ABB-BBC POWERSHIELD SS1-SS6

SIEMENS-ALLIS STATIC TRIP 1

SIEMENS-ALLIS STATIC TRIP 2

SIEMENS-ALLIS LIMIT TRIP

MULTILIN FB-600

SYLVANIA

ITEKTOR

WESTINGHOUSE AMPTECTOR IA-IIA

WESTINGHOUSE DIGI-TRIP

1 AMP SYSTEM CHART

The following charts show the values when testing a **WESTRIP RMS-2000-1A.**

Chart 3A – Long Time Delay

		Test Current Level					
		200%		300%		600%	
	*Time in Seconds	Low Side	High Side	Low Side	High Side	Low Side	High Side
Delay Setting	2	14.4	21.6	6.4	9.6	1.6	2.5
	3	21.6	32.4	9.6	14.4	2.4	3.8
	4	28.8	43.2	12.8	19.2	3.2	5.0
	5	36	54	16	24	4	6.3
	7	50.4	75.6	22.4	33.6	5.6	8.8
	10	72	108	32	48	8	12.5
	12	86.4	129.6	38.4	57.6	9.6	15
	15	108	162	48	72	12	18.8
	20	144	216	64	96	16	25
	24	172.8	259.2	76.8	115.2	19.2	30

Chart 3B – Short Time Delay

		Test Current Level	
	*Time in milliseconds	150%	
		Low Side	High Side
Delay Setting	.1	80	125
	.15	120	188
	.2	160	250
	.25	200	313
	.3	240	375
	.35	280	438
	.4	320	500
	.45	360	563
	.5	400	625
	**I^2T	.58 Sec.	.90 Sec.

**I^2T Test Settings: 'AMP TAP' = '1.0',
'SHORT TIME' = '2', Test current = 3A.

Chart 3D – Ground Fault Delay

		Test Current Level	
	*Time in milliseconds	300%	
		Low Side	High Side
Delay Setting	.1	80	125
	.15	120	188
	.2	160	250
	.25	200	313
	.3	240	375
	.35	280	438
	.4	320	500
	.45	360	563
	.5	400	625
	.6	480	750

Chart 3C – Instantaneous Delay

Set Secondary Current	No More Than
To 150% of Chart 4C	.06 Sec

Chart 4A – Long Time Pick-up Currents

		LONG TIME PICK UP						
		.4	.5	.6	.7	.8	.9	1.0
Amp Tap	.5	.20	.25	.30	.35	.40	.45	.50
	.6	.24	.30	.36	.42	.48	.54	.60
	.7	.28	.35	.42	.49	.56	.63	.70
	.8	.32	.40	.48	.56	.64	.72	.80
	.9	.36	.45	.54	.63	.72	.81	.90
	1.0	.40	.50	.60	.70	.80	.90	1.00

Chart 4B – Short Time Pick-up Currents

		SHORT TIME PICK UP									
		1.5	2	3	4	5	6	7	8	9	10
A	.5	.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
	.6	.90	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00
	.7	1.05	1.40	2.10	2.80	3.50	4.20	4.90	5.60	6.30	7.00

	.8	1.20	1.60	2.40	3.20	4.00	4.80	5.60	6.40	7.20	8.00
	.9	1.35	1.80	2.70	3.60	4.50	5.40	6.30	7.20	8.10	9.00
	1.0	1.50	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.0

Chart 4C – Instantaneous Pick-up Currents

		INSTANTANEOUS PICK UP									
		2	3	4	5	6	7	8	9	10	12
Amp Tap	.5	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	6.00
	.6	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	7.20
	.7	1.40	2.10	2.80	3.50	4.20	4.90	5.60	6.30	7.00	8.40
	.8	1.60	2.40	3.20	4.00	4.80	5.60	6.40	7.20	8.00	9.60
	.9	1.80	2.70	3.60	4.50	5.40	6.30	7.20	8.10	9.00	10.8
	1.0	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.0	12.0

Chart 4D – Ground Fault Pick-up Currents

GROUND FAULT PICK UP									
.25	.3	.35	.4	.5	.6	.75	1.0	2.0	Defeat
.25	.30	.35	.40	.50	.60	.75	1.0	2.0	No Trip

NOTE – 'GROUND FAULT' Pick ups not affected by 'AMP TAP' setting.