# REBIS PROGRAMMABLE PAN SYSTEM

The image position of a particular sound in a stereo monitoring field is fixed by the relative levels of that sound from the two monitor speakers. Panning is the movement of a particular sound image within the stereo field.

The Rebis Pan System is based on the RA216 Dual VCA (Voltage Controlled Amplifier). The VCA's alter the left and right signal levels in response to a D.C. control voltage from the RA215 Programmable Pan Controller.

The RA215 is a sophisticated oscillator which digitally generates a D.C. triangle wave output. By arranging for one VCA to be driven up whilst the other is driven down automatic panning can be achieved.

The combination of a digital controller and the best in VCA technology has produced a panner with unrivalled specifications and facilities.
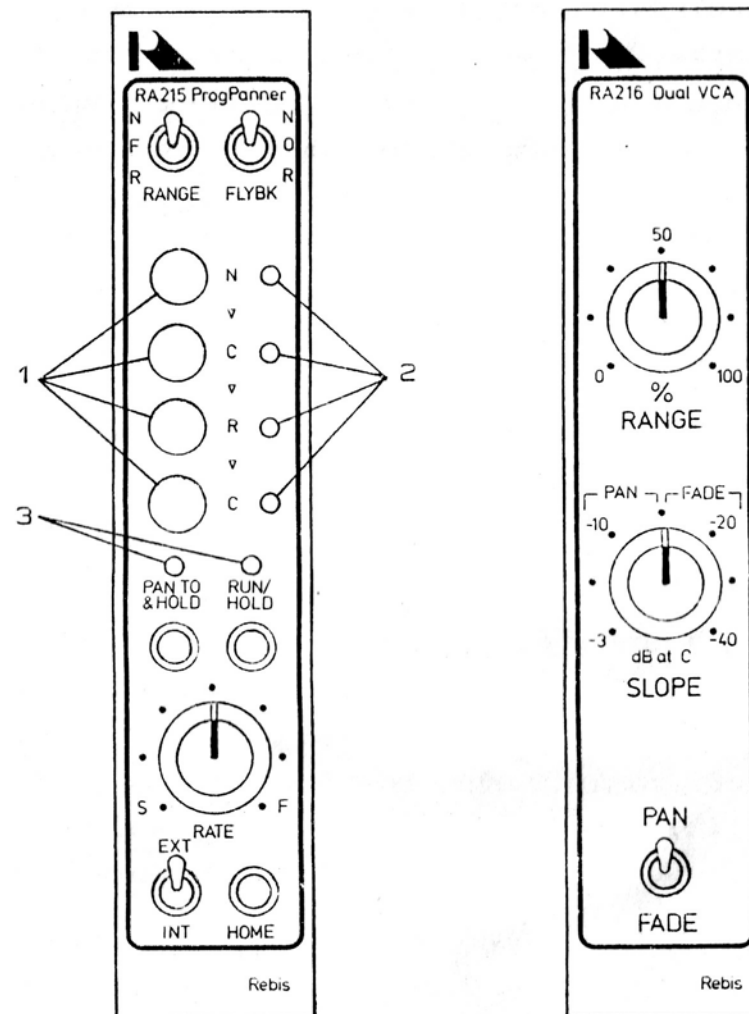
1. Hold Position Select Switches.

2. Position Indicator LED's.

3. Signal Movement LED's.

INSTALLATION

The wiring diagram on the following page
shows how to connect up the Pan System.The
method shown provides a convenient system
of normalling for mono/stereo use.The VCA
mix inputs (pin 13) could also be brought
out on jacks,and normalled through as in the
diagram,for further system flexibility.The
various external inputs could also be put on
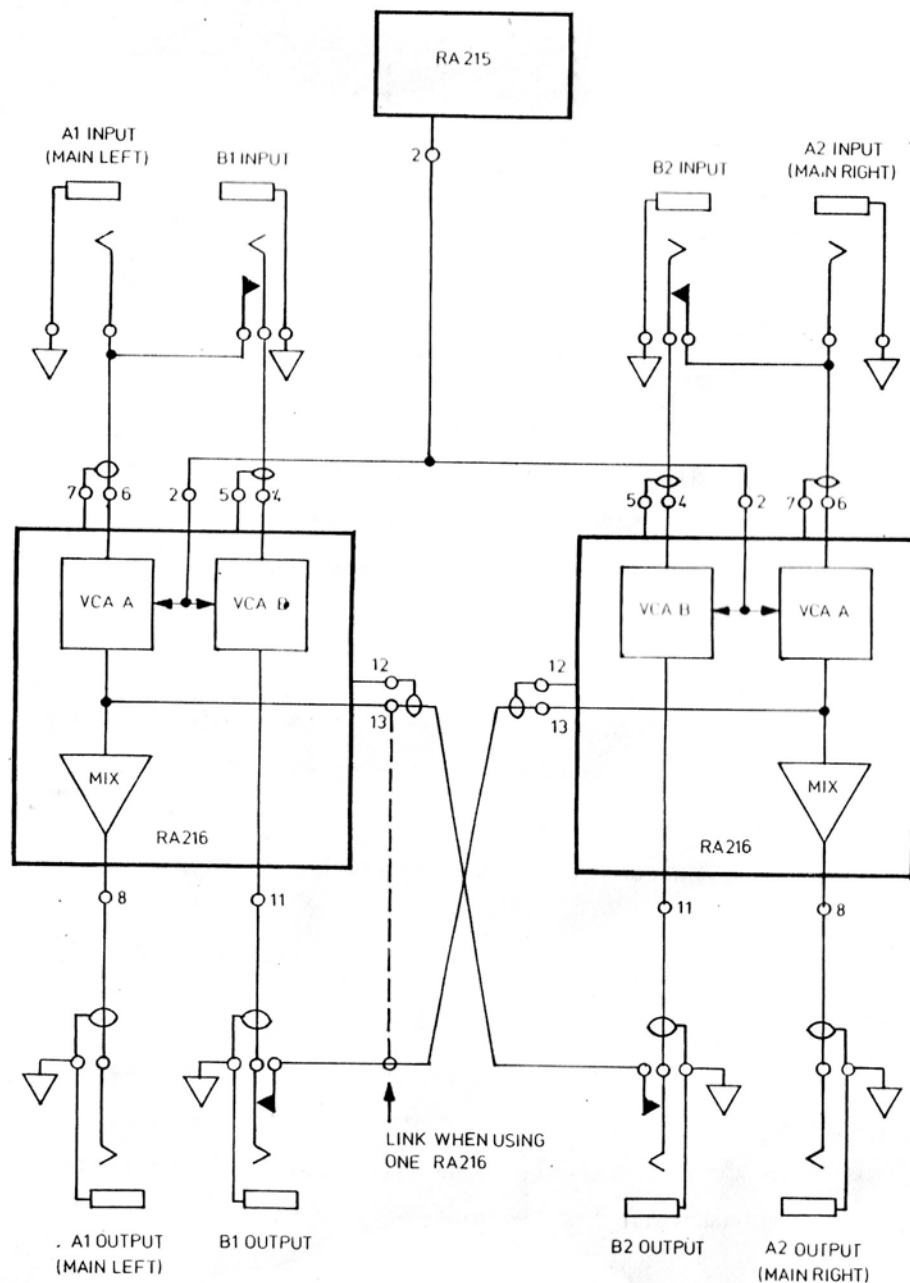connectors as required.

The VCA direct control inputs (pins 15
and 16) are intended for special applications
and do not need to be connected for the normal
system to work.

Screened cables should be used for all
signal connections with screens connected as
shown in the diagram.The calibrate link (pin
14's) and the control output/input link (pin
2's) can be made with tinned copper wire.

EARTHING

When installing the modules in a Rebis
Rack Frame ensure that they are firmly
screwed in and that the rack is earthed,as it
is essential both for safety and screening
that the front panels are ultimately connected
to mains earth.

PAN SYSTEM WIRING DIAGRAM

RA 215

A1 INPUT (MAIN LEFT)   B1 INPUT   2   B2 INPUT   A2 INPUT (MAIN RIGHT)

7 6   2 5 4   5 4 2   7 6

VCA A   VCA B   VCA B   VCA A

12   12
13   13

MIX   MIX

RA216   RA216

8   11   11   8

LINK WHEN USING ONE RA216

A1 OUTPUT (MAIN LEFT)   B1 OUTPUT   B2 OUTPUT   A2 OUTPUT (MAIN RIGHT)

JACKFIELD EARTH   CABLE SCREEN

RA215 PIN CONNECTIONS.

1) Keyway slot.
2) Output. 0 to +15 volts.
3,4,5,6,7,8) Spare
9) Main 0 Volts.
10) +40 Volts.
11) RUN/HOLD external output.
12) RUN/HOLD external input.*
13) PAN TO & HOLD external input.*
14) Spare
15) External RATE input [1-12 Volts D.C.]
16) HOME external input.*

* External inputs plus 3 to 40 Volts, input impedance 100 kilohms.

RA216 PIN CONNECTIONS.

1) Keyway slot.
2) Control input. 0 to +15 Volts.
3) Spare.
4) B input.
5) Screen 0 Volts.*
6) A input
7) Screen 0 Volts.*
8) A output.
9) Main 0 Volts.
10) +40 Volts.
11) B output.
12) Screen 0 Volts.*
13) Mix input [to A]
14) Spare
15) VCA. A direct control input.
16) VCA. B direct control input.

* Screen points connected to 0 volts on board, use for screens of signal cables.

Note: VCA direct inputs [pins 15 & 16] require 0 to 15 volts, input impedance is 47 kilohms. Attenuation is 6dB/volt, +15 volts gives 0dB attenuation. When using these inputs turn RANGE control to 0%.

RA216. DUAL VCA.

Only one RA216 Dual VCA is required to pan
a mono source, cross fade two mono sources or
fade a stereo source. Two are needed for
stereo image reversal, cross fade and cross
panning 2 mono sources.

CONTROLS.

RANGE CONTROL: This sets the control voltage
level which reaches the VCA's from the RA215
Pan Controller. In the PAN mode this will alter
the total width over which the image is swept
and in the FADE mode it fixes the depth of
fade. With the control set to 0% no control
voltage reaches the VCA's and the RA216 is
effectively bypassed.

SLOPE CONTROL: To pan an image smoothly the
total perceived level should remain constant
wherever the image is positioned. In the
ideal monitoring environment where sound
arriving at the listener is coherent (i.e. in
the same phase relationship) the signals from
each speaker add perfectly. This means that
for smooth panning the level at the centre
should be 6dB lower than that at the ends. To
prevent level changes this difference is also
required where a mono mix of a stereo original
is to be made. In the average listening
situation signals do not add in this way and
a 3dB attenuation at centre is nearer to being
correct.

The SLOPE control allows the user to set
the attenuations at centre. From 3dB to 6dB
down at centre a smooth pan is produced, from
6dB to 15dB the ends of the pan become more
noticeable, above 15dB the RA216 starts to act
as two faders, alternately bringing up the right
and left signals. This is one reason for the
division of the SLOPE control range into two
halves, PAN and FADE.

When in the FADE mode the SLOPE control
sets the level at the centre (in time) of the
fade.

PAN/FADE SWITCH: In the PAN position this
switch inverts the control waveform to one of
the VCA's, so that as one signal is rising the
other is falling. This position is also used
for cross fading two mono sources.

In the FADE position both VCA's work
together and the RA216 functions as a stereo
fader.

BLOCK DIAGRAM
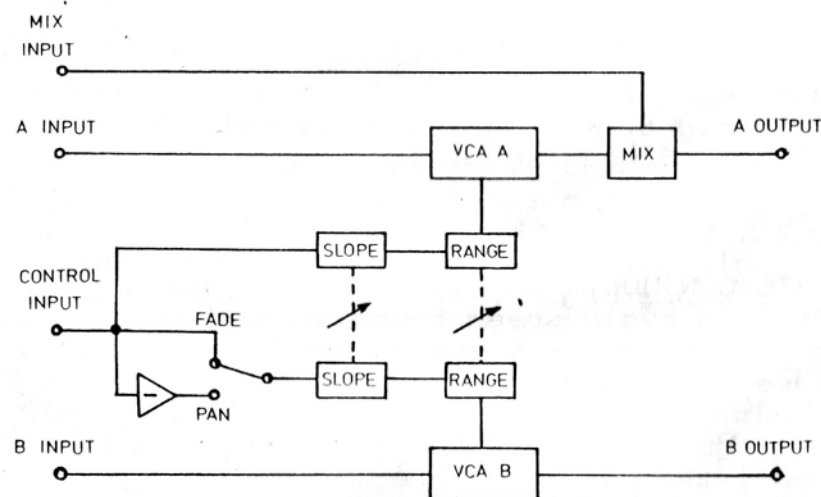
RA215. PAN CONTROLLER.

The RA215 is basically an oscillator which produces a D.C. triangle wave output. The heart of the unit is a clock which drives a digital counter whose outputs are summed to produce the triangle wave. Detection circuits which look at the counters outputs allow the oscillator to be stopped at accurate points in the wave. This digitally based system gives the RA215 a host of sophisticated features.

In the following descriptions it is assumed that the pan system has been wired as suggested in this manual. (inputs and outputs normalled for mono/stereo use as shown in the connection diagram). Also note that in stereo operation N is normal (i.e. left input goes to left output, right input to right output) C is mono, and R is reversed (left input goes to right output, right input goes to left output). For mono operation N becomes left, C is centre and R is right. When fading N is full up, C is centre of fade and R is off.

CONTROLS.

RATE CONTROL & INT/EXT SWITCH: Varies the RA215's cycle speed from ten cycles per second to one minute per cycle. Switched to EXT the same speed range is covered by a positive D.C. input range of 1 to 12 volts. The external rate input can be driven by the RA208 Modulator for modulated pan/fade speed.

RUN/HOLD SWITCH & LED: Pushing the RUN/HOLD Button starts the RA215 cycling, and the indicator LED comes on to show movement mode selected. Pushing the button again will stop the cycle at any point required. This switch can also be used to stop or start the cycle when the PAN TO & HOLD switch has been used.

PAN TO & HOLD SWITCH & LED and HOLD SELECT SWITCHES: When this button is used the HOLD SELECT switches come into operation. When one or more HOLD SELECT switches are in pushing the PAN TO & HOLD BUTTON will light the LED movement indicator and start the unit cycling until it reaches the next HOLD SELECT position. With no HOLD SELECT switches in the PAN TO & HOLD switch will merely start the RA215 cycling, pushing it again will have no effect.

The RUN/HOLD, PAN TO & HOLD and HOLD SELECT switches can be used in conjunction to produce a complete range of pre set panning effects.

POSITION INDICATOR LEDS: These LED's follow the output cycle of the RA215. When one LED is on this shows that the signal is held at that point. When two LED's are on the signal is either stopped between these points (movement LED's off) or moving between them (movement LED's on).

HOME BUTTON: When this button is pushed VCA outputs return immediately to the N position. The Home position can be changed if required by replugging the home position selector wire on the circuit board into the desired socket (See PCB layout).

FLYBACK SWITCH: In the pan mode with a mono input selecting the N position pans the output from left to right, the signal then flys back to the left and pans to the right again etc. The R position produces the reverse effect.

In the pan mode with a stereo input and the N position selected the image pans from normal through mono to reverse then jumps back to normal Again the R position reverses the effect. The O position is out.
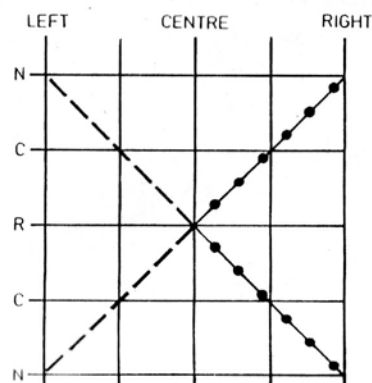
In the fade mode signal level will either fade down and jump back to full (N) or the reverse (R).

RANGE SWITCH: The RANGE switch effectively
moves the RA215's normal range of control to
either the left or right half of the full
stereo field. In the diagrams below N, C, R
and C relate to the POSITION INDICATOR LED's
and the HOLD SELECT switches.
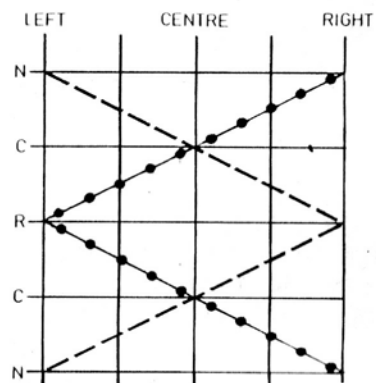
'F' position.   'N' position.*

——— Image position of left input.
●━●━ Image position of right input.
* 'R' position reverses signals.

OPERATING HINTS

After switching on push the HOME button
then RUN/HOLD then HOME again. This clears
the RA215 ready for use.

First a few things to watch for if you
are getting no effect.

1) Check RANGE control(s) are turned up.
2) Check INT/EXT switch is in the INT
    position.
3) Set SLOPE control(s) to suit operation
    mode, PAN or FADE.
4) Fast pan rates sound like tremolo, not
    panning.

The pan effect is most noticeable on a
mono source. The audibility of stereo image
reversal is very dependent on the initial
stereo image. If the stereo field is well
filled and there is a predominant central
component this will mask the reversal effect.
Some thought about careful instrument
positioning is needed for best results.

An alternative to stereo image reversal
is stereo balance shift. Just one RA216 is
needed, stereo in and out (see input/output
configurations). Used in this way the system
produces the same effect as a balance
control. Remeber that the RANGE control can
be used to stop the left and right signals
going fully off.

The RANGE controls allow an effect to
be gradually brought in or taken out. They
also provide individual bypass for each
RA216.

If you have a Rebis Delay System use
the RA208 Modulator to drive the external
RATE input. Modulated pan/fade speed can
be very effective. Also try simultaneous
delay and pan/fade effects.

External RUN/HOLD and PAN TO & HOLD inputs can stop and start pan/fade cycles in time with an audio input such as a bass · drum track.

A reverse envelope effect can be produced with FADE mode and FLYBACK.Trigger start of fade up with external PAN TO & HOLD input using HOLD at N or R.

Using the system as a straightforward autofader to control up to four levels can get you out of some awkward corners.

INPUT/OUTPUT CONFIGURATIONS

RA215 & ONE RA216

	INPUT	OUTPUT
Mono Source Pan	A1	A1 & B1
Cross Fade of Two Mono Sources (PAN mode)	A1 & B1	A1
Stereo Fade (FADE mode) or Stereo Balance Shift (PAN mode)	A1 & B1	A1 & B1

RA215 & TWO RA216's

	INPUT	OUTPUT
Stereo Image Reversal or Dual Mono Pan	A1 & A2	A1 & A2
Quad Fade	A1,B1,A2,B2	A1,B1,A2,B2
Stereo Cross Fade of Two Stereo Sources (PAN mode)	(A1 & B1) (A2 & B2)	A1 & A2